Better Homes and Gardens®

# WOOD®

THE MAGAZINE FOR HOME WOODWORKERS

$3.95

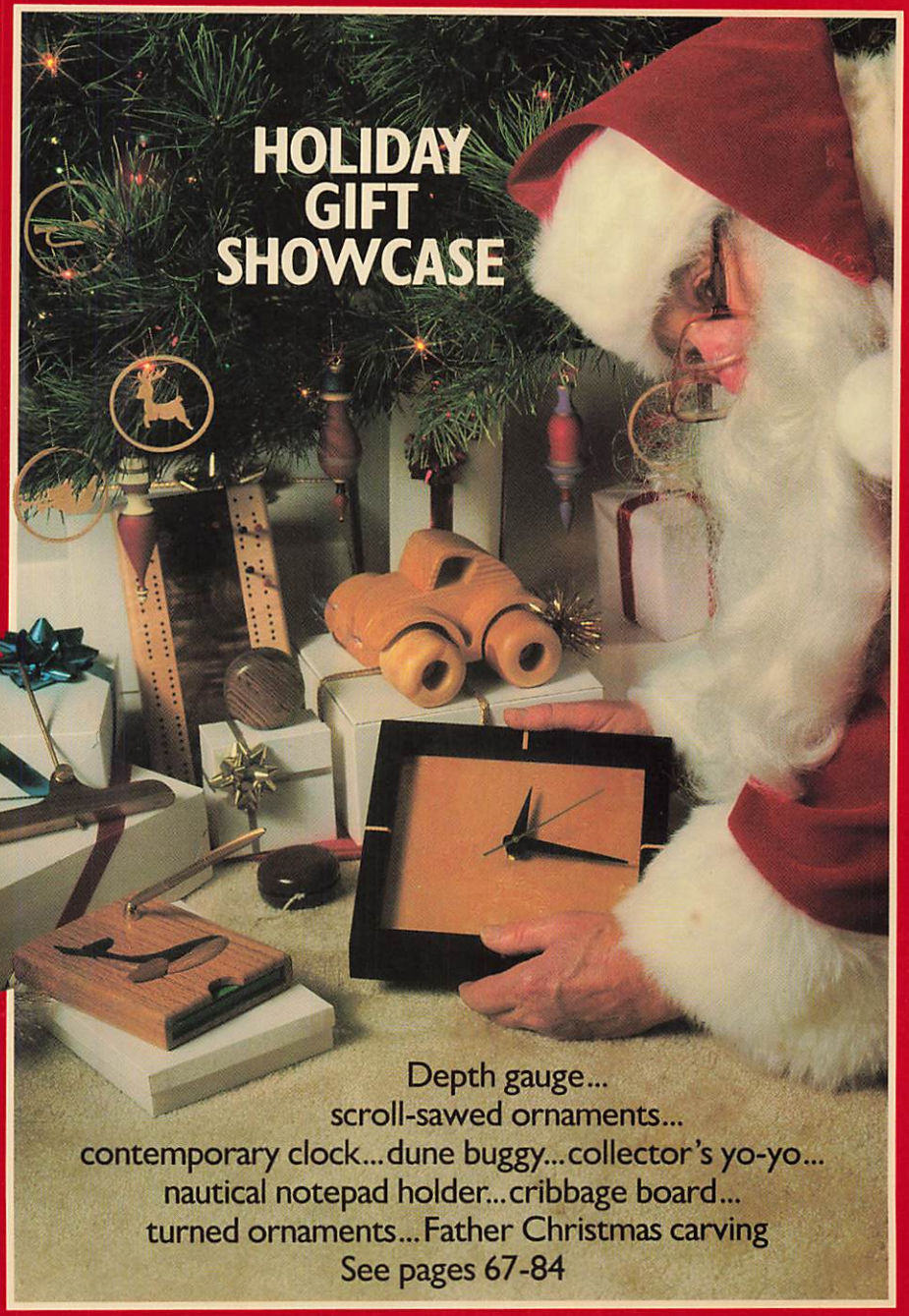
DECEMBER 1988•ISSUE NO. 26
Display until December 20

**WIN! Design-A-Toy™ Contest**
NEARLY $17,000 IN PRIZES • See Page 6

## LOOKING FOR A SHOP VACUUM?
Check out our specifications chart and performance evaluations

## LEARN HOW TO MAKE AND INSTALL WOOD INLAYS
It's easy with our new techniques

## 24 TERRIFIC TIPS FROM YOUR SHOP AND OURS
(See page 16)




Depth gauge...
scroll-sawed ornaments...
contemporary clock...dune buggy...collector's yo-yo...
nautical notepad holder...cribbage board...
turned ornaments...Father Christmas carving
See pages 67-84

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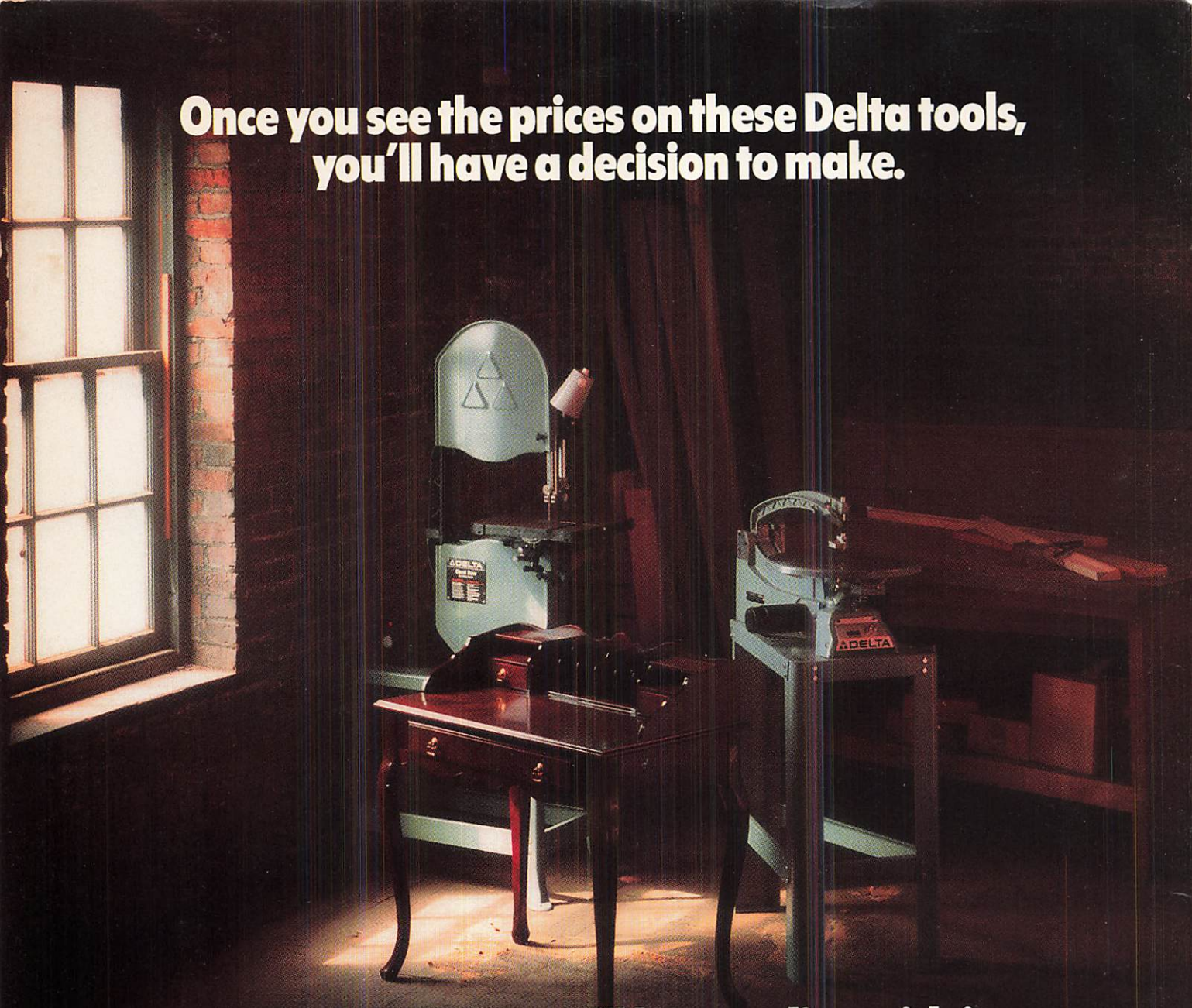
# Once you see the prices on these Delta tools, you'll have a decision to make.




# Just remember, you'll have to live with it for a long time.

It happens with Delta tools. They outlast the best of us. It's just the way they're built. So make your choice carefully.

But you'd better not waste a whole lot of time deciding. Because for a limited time, we're offering our 14″ Wood Cutting Band Saw and 18″ Electronic Scroll Saw for a sale price you won't believe.

**14″ BAND SAW $499.**

**18″ SCROLL SAW $699.**

Give our Band Saw* a look. It's only $499. In case you're wondering, that adds up to $283 off the suggested retail price. And with its heavy-duty construction, ½ HP motor, lamp attachment and steel stand, you'll be able to do all kinds of contour cutting, straight cutting or resawing.

But the deal doesn't stop there. Not by a long shot. Because our 18″ Electronic Variable Speed Scroll Saw is only $699. And since we're talking numbers, that adds up to savings of $315. And the saw itself? Just pick a speed. Any speed. Lock it in. Electronically. Take a curve anywhere from 40 to 2000 CS/M. And work in areas as tight as $^1/_{64}$″ diameter, on stock up to 2″ thick.

The Delta 14″ Wood Cutting Band Saw. Or the 18″ Electronic Scroll Saw. A tough choice, indeed. Then again, if you consider how much you save on both…you might avoid having to make a decision altogether.

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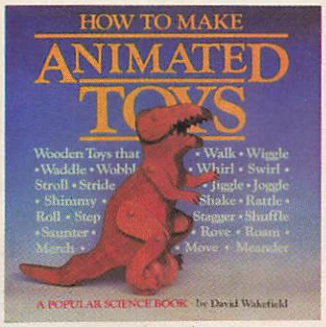


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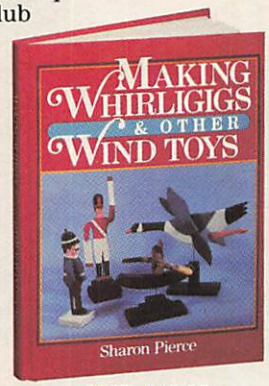


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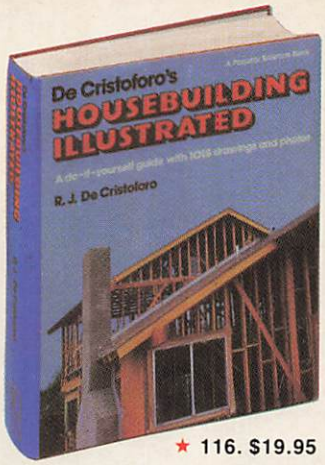


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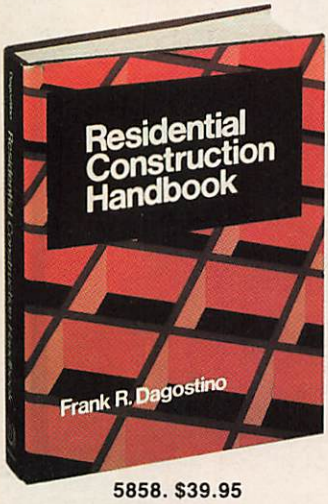


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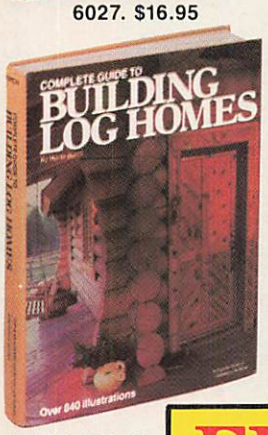


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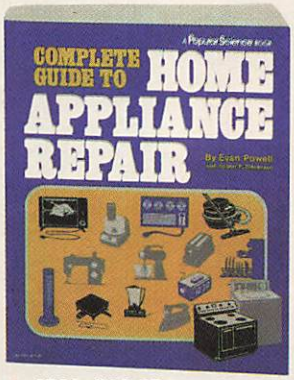


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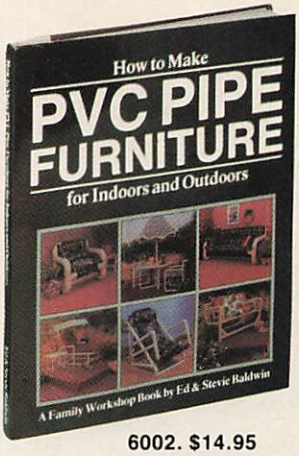


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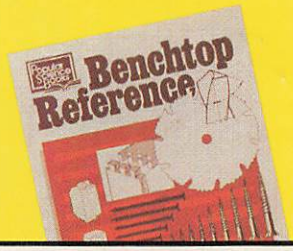


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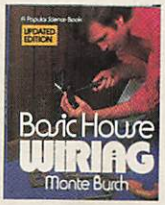


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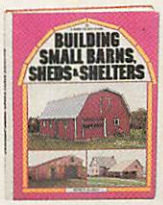


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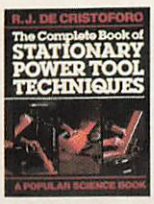


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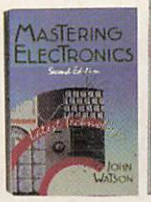


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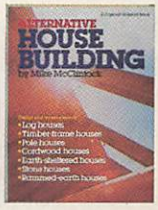


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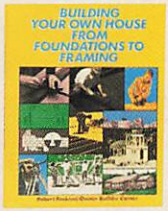


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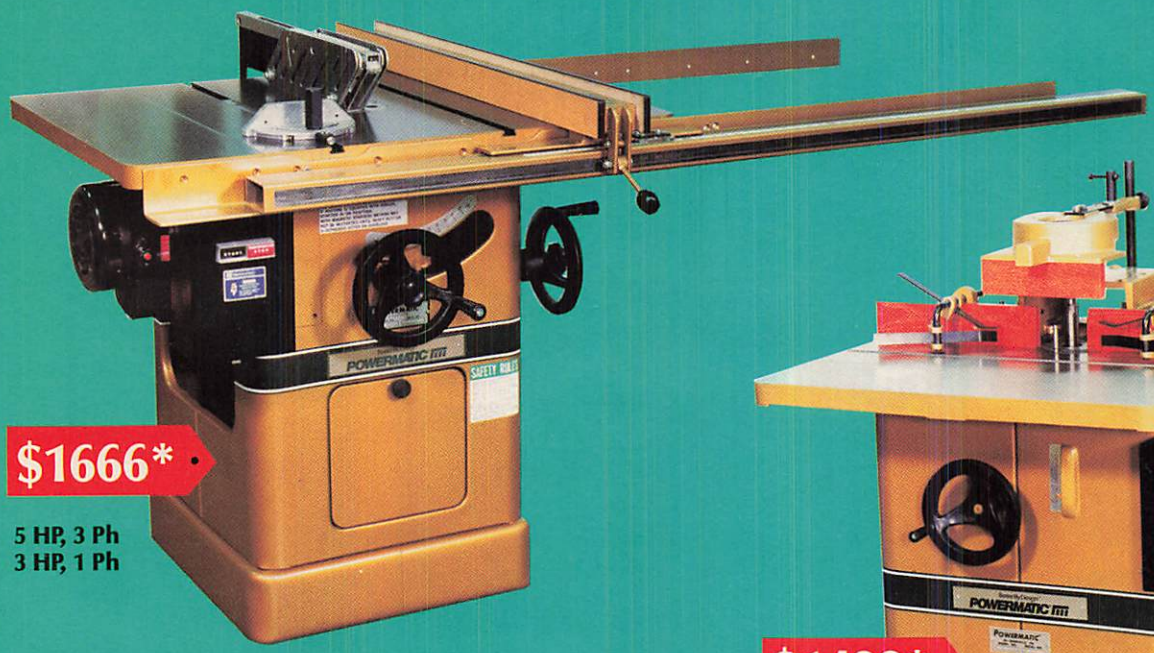
# A GREAT DEAL MORE *Sale!*




**$1666***

**5 HP, 3 Ph**
**3 HP, 1 Ph**

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Not since the late 1970's have Powermatic's prices on the 66 TA Saws and 26 Shapers been so low! On machines that deliver *a great deal more* features than the competition's.

Rugged cast iron construction. Massive key components. High resale values.

For even more value, Powermatic now offers these machines in 5 horsepower, single phase — an industry exclusive!

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*Suggested consumer price

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# DESIGN-A-TOY™ CONTEST INFORMATION

*Continued from page 6*

| PRIZES | | |
|---|---|---|
| Divisions | Toys with Movable Parts | Toys Without Movable Parts |
| **Grand Prizes: $1,500 in merchandise** | | |
| School Age<br>Home Hobbyist<br>Professional | Total Shop<br>Foley Belsaw<br>AMI/Hegner | Black & Decker<br>Delta<br>Freud |
| **First Prizes: $250 in merchandise** | | |
| School Age<br>Home Hobbyist<br>Professional | Hitachi<br>Makita<br>Garrett Wade | Grizzly<br>Skil<br>Bosch |
| **Special Citations: $100 in merchandise (Five awards in each category)** | | |
| School Age<br>Home Hobbyist<br>Professional | Formby's<br>Popular Science Book Club<br>Woodmaster Tools | DML<br>Dremel<br>Minwax |
| All nonwinners eligible for drawing:<br>$1,400 Shopsmith Mark V 500 system<br>$1,000 in Porter-Cable merchandise<br>$500 in Ryobi merchandise<br>$250 in AEG merchandise<br>3 Ripstrates from Fisher-Hill Products | | |

## RULES

1. Toys must be your original design. A different approach to an existing toy would qualify. Please, do not not enter toys with only subtle changes from published patterns.
2. Make projects no larger than 24x24x24". The primary material should be wood, but may incorporate other materials. Examples of Toys With Movable Parts include pull toys and cars. Examples of Toys Without Movable Parts include puzzles and doll furniture.
3. Please follow Consumer Product Safety Commission guidelines:
- Nontoxic woods and wood finishes only;
- No parts smaller than 1¼" square on toys for children under 3 years of age;
- No sharp corners or points;
- Pull strings longer than 12" should not have beads or other attachments that could tangle and form a loop.

**Deadline:** Entries must be received by February 1, 1989 at Design-A-Toy™, WOOD® Magazine, 17th at Locust, Des Moines, IA 50336. All entries must be postpaid; collect entries will be refused. Attach an official entry label to each toy. Enter as many times as you wish. The entry label may be photocopied.

**Name** _____

**Phone:** Home ( ) _____ Work ( ) _____

**Address** _____

**City** _____

**State** _____ **Zip:** _____

I certify that I have designed and built this toy myself. Should my entry win, I agree to cooperate with WOOD magazine in supplying builder's notes and a bill of materials.

**Signature** _____ **Date:** _____


**MAKE BEAUTIFUL RAISED PANEL DOORS . . . WITH YOUR 1/4" ROUTER!**

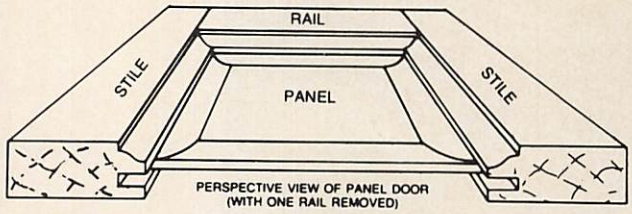
Professional production quality bit makes it quick and easy to produce matching rails and stiles — the panel raising bit with ball bearing guide makes the raised panel perfect every time.

Regular value Over $150.00

SALE PRICE **$69.95** FOR COMPLETE SET

SAVE 55%

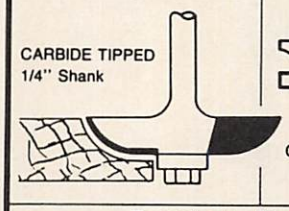
ORDER ITEM #054 for 1/4" Shank Set (Includes all bits shown)




PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

**RAISED PANEL BIT** SUPPLIED WITH BALL BEARING

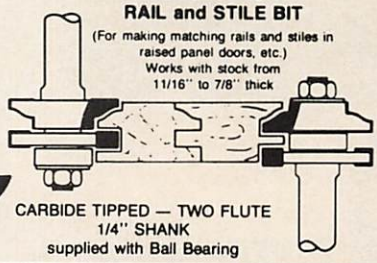
2" Large Diameter



CARBIDE TIPPED 1/4" Shank

**REVERSIBLE COMBINATION RAIL and STILE BIT**

(For making matching rails and stiles in raised panel doors, etc.) Works with stock from 11/16" to 7/8" thick



CARBIDE TIPPED — TWO FLUTE 1/4" SHANK supplied with Ball Bearing

**To order by Mastercard or Visa Toll Free 7 Day—24 Hour Order Service, Call 1-800-533-9298 or send check to: MLCS, Ltd., P.O. Box 4053D, Rydal, PA 19046**



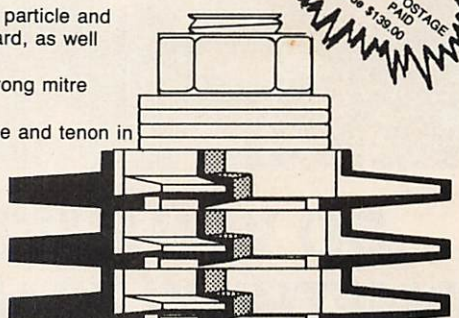
**FINGER JOINT ROUTER BIT #161**

a professional production quality bit makes better edge and end grain joints by increasing the glue surface area

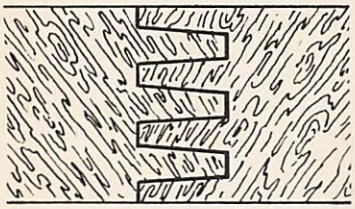
Special Offer $69.00 POSTAGE PAID

Retail Value $139.00

- Ideal for joining particle and composition board, as well as solid wood
- Makes super strong mitre joints
- Replaces mortise and tenon in many cases
- Quick and accurate set ups
- Joins 1/2" — 1" in one pass; 1" and up with multiple passes



FULL SCALE

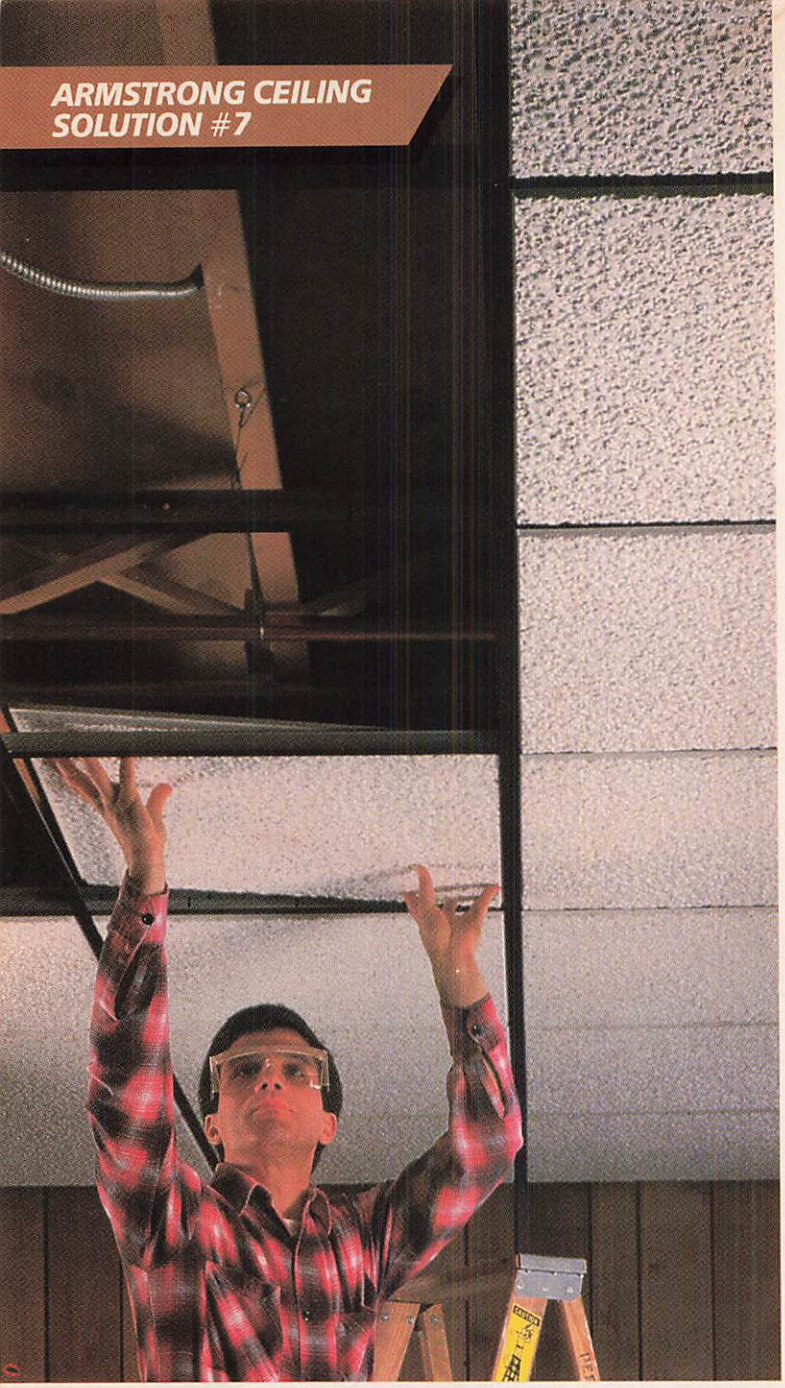


Three 3-wing carbide cutters on arbor

Actual Size Bit #161 1/2" Shank

- The 3 cutters have ½" bore and can be used on a shaper with ½" spindle.
- An additional cutter can also be added to the arbor for use on a router
- Individual cutters cost $20.00 each Order #161-C for cutter only

To order by Master Charge or Visa Toll Free 7 Day — 24 Hour Order Service, Call 1-800-533-9298 or send check to: MLCS Ltd., P.O. Box 4053D, Rydal, PA 19046




Bravada Panel

# DO YOU HAVE SOMETHING TO HIDE?

*Exposed pipes and wiring disappear when you make an Armstrong suspended ceiling part of your basement remodeling project. Panels drop right into the grid system . . . and lift out for easy access to the plumbing and wiring they hide. You can select from a variety of designs including many that help keep down noise and are fire-retardant.*

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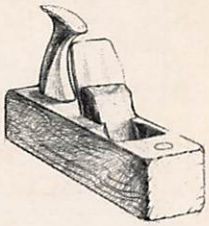
**Armstrong**
*makes your home so nice to come home to℠*


# TALKING BACK

**We welcome comments, criticisms, suggestions, and even an occasional compliment. The volume of mail we receive makes it impossible to answer every letter, but we promise to do our best. Send your correspondence to: Letters Editor, Better Homes and Gardens® WOOD® Magazine, Locust at 17th, Des Moines, IA 50336.**

## YES, YOU CAN MAKE HAND TOOLS

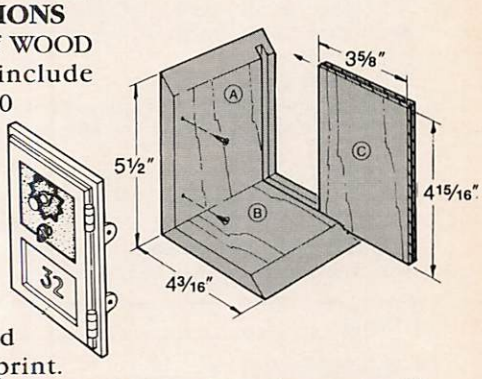


In response to Arkansas reader Carlton Measels (June 1988), I feel that there are times when a hand tool has advantages over a power tool. And, hand tools are quiet. The intimate knowledge gained by making a hand tool will help the woodworker use it with greater understanding and "feel" for the job. Enclosed is a list of resources that provide answers in learning ways to acquire or build your own tools.

***—Adam Chamberlain, Santa Clara, Calif.***

*Many thanks, Adam, for your list. Even a partial listing of your references is impossible in our limited space, but both you and reader Bob Null of Phoenix agree on a couple of worthy titles written by Alexander G. Weygers. Prentice Hall Press published both titles:* The Making of Tools, *($11.95) and* The Modern Blacksmith, *($10.95). Also consider a booklet by David G. Perch and Leonard G. Lee,* How to Make a Plane. *Write Garrett Wade Co., 161 Avenue of the Americas, New York, NY 10013; phone 800-221-2942 (N.Y. residents, 212/807-1757). The book, catalog no. 49L01, sells for $7.25 ppd.*

## CRACKING THE OAK SAFE DIMENSIONS




In every issue of WOOD magazine, we include well over 2,000 drawing labels and dimensions. And unfortunately, every once in a while an incorrect one slips through and makes it into print. That's what happened with the mini safe on page 78 of the October, 1988 issue. We built the project (two in fact), only to put a wrong dimension on the drawing. The length of the sides A should be 5½" instead of the 4½" shown on the drawing. And, the length of the box back (C) should be 4¹⁵⁄₁₆" instead of the 3¹⁵⁄₁₆" listed in the Bill of Materials.

We sincerely apologize for any inconvenience this may have caused you.

## IN SUPPORT OF LOGGERS

I enjoy your magazine very much, especially the article in the June 1988 issue on stave-bowl turning that shows the techniques involved in creating top-quality wood bowls. I hope your magazine will continue in this direction. However, what attracted my attention was the "Talking Back" letter and your excellent response concerning preserving the tropical rain forests.

Your response was that commercial harvesting of mahogany has little to do with the destruction of rain forests, but rather the conversion to agriculture, roads, and mining destroy the forests. I agree.

I live in a community where loggers harvest redwood trees for lumber. Here, the logging companies replant for future harvests. They primarily replant in areas cleared for temporary roads and work areas.

I write this because I continually see letters and articles unfairly attacking logging concerns. Most loggers have solid practices; they are in business to stay. I realize your magazine is not a political publication, but I wish to call your attention to the extensive destruction of forests around the world by those involved in illegal drugs.

Recently, for example, several of our government officials flew over large areas of Peru and were appalled at the destruction of forests—as far as the eye could see—for cocaine production. Those involved in illegal drugs could care less about our forests let alone human beings.

***—James D. Hooper, D.D.S., Fort Bragg, Calif.***

*We talked to Mitch Talcove, owner of a sawmill in Mexico and importer of exotic hardwood from Central America. Mitch, who lived for 8½ years in Mexico, believes some peasants grow marijuana or coca because of economic necessity. "It's the only way they can survive," Mitch says. "We say slashing and burning isn't good for the world, but they're thinking about their families. What would you do?*

*"You can't stop illegal people from doing everything. And there is no way we can stop deforestation. People down there believe they must slash the land to try to grow crops or graze cattle."*

*Although he has seen illegal slashing and burning right along the road, Mitch and other sawmill operators face stiff penalties and fines if they bring a dead or burned tree to a sawmill. By law, the Mexican forestry department must first mark each tree his company cuts and takes to the sawmill.*

*"Clear cutting and selectively harvesting hardwood are two different things," Mitch says. "Slashing and burning have nothing to do with the hardwood business. I often see a tree that's going to be burned, but I'm not allowed to use it!"*

*Continued on page 14*

Willow Square Tile

**ARE YOUR KIDS DISTURBING THE PEACE?**

When you're tired of yelling "keep it down," put up an Armstrong ceiling. Armstrong acoustical ceilings help keep the noise down. Available in many decorative designs, they also put cracks and stains permanently out of sight. And Armstrong tile ceilings are easy to install with our exclusive Easy Up® Tile Installation Kits.

For free literature, including "49 Armstrong Ceiling Solutions," and the name of a nearby Armstrong retailer, call us at 1 800 233-3823, and ask for Dept. 8CRWO. Or write to: Armstrong, Dept. 8CRWO, P.O. Box 3001, Lancaster, PA 17604.

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## BOSCH

TOP HANDLE JIG SAW
ITEM #1581VS

SALE $129

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 1581VS | TOP HANDLE JIG SAW | $129 |
| 1582VS | BARREL GRIP JIG SAW | 119 |
| 3270D | 3 x 21 DUSTLESS BELT SANDER | 128 |
| 1272D | 3 x 24 DUSTLESS BELT SANDER | 168 |
| 1273D | 4 x 24 DUSTLESS BELT SANDER | 178 |
| 1273DVS | 4 x 24 VARIABLE SPEED DUSTLESS BELT SANDER | 198 |
| 3258 | 3-1/4 PLANER W/CARBIDE BLADE | 119 |
| 1347 | 4-1/2 MINI GRINDER | 83 |
| 1604 | 1-3/4 HP ROUTER | 124 |
| 1611 | 3 HP PLUNGE ROUTER | 199 |
| 1608 | TRIM ROUTER | 79 |
| 1608L | LAMINATE TRIMMER | 83 |
| 1608T | TILT BASE LAM. TRIMMER | 89 |
| 1609 | OFFSET BASE LAM. TRIMMER | 118 |
| 1609K | TRIMMER INSTALLERS KIT W/CASE | 167 |
| 11212VSR | 3/4 SDS ROTARY HAMMER W/CASE | 194 |
| 11202B | 1-1/2 ROTARY HAMMER | 369 |
| 11203B | 1-1/2 ROTARY HAMMER | 396 |
| 1198VSR | 1/2 VSR HAMMER DRILL | 125 |
| 1832VSK | RECIPROCATING SAW KIT W/CASE | 129 |
| 1942 | HEAVY DUTY HEAT GUN | 65 |

## Hitachi

ITEM TR12
SALE $164

1/2" PLUNGE ROUTER
3 H.P. WITH ACCESSORIES

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| TR12 | 3 H.P. PLUNGE ROUTER W/ACC | $164 |
| C10FA | DELUXE 10" MITER SAW | 264 |
| C15FB | DELUXE 15" MITER SAW | 369* |
| C8FB | 8½" COMPOUND MITER SAW | 539 |
| P100F | 12" PLANER | 998* |
| F1000A | 12" PLANER JOINER | 1348* |
| CB75F | BAND SAW ACCEPTS 1/4" TO 3" BLADES | 1498* |
| R100 | DUST COLLECTOR | 489* |
| 15-80AL | 15" CARBIDE BLADE 80T ALUM. | 80 |
| 15-110W | 15" CARBIDE BLADE 110T WOOD | 108 |
| 15-120P | 15" CARBIDE BLADE 120T PLASTIC | 108 |
| 998862 | 8-1/2" CARBIDE BLADE 60T FOR C8FB | 47 |

* FREIGHT COLLECT

## PORTER+CABLE

ITEM #330
SALE $54

SPEED BLOCK FINISHING SANDER

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 314 | 4-1/2" TRIM SAW | $124 |
| 330 | SPEED-BLOC FINISHING SANDER | 54 |
| 345 | 6" SAW BOSS | 98 |
| 352 | 3 x 21 DUSTLESS BELT SANDER | 127 |
| 360 | 3 x 24 DUSTLESS BELT SANDER | 184 |
| 362 | 4 x 24 DUSTLESS BELT SANDER | 197 |
| 505 | 1/2 SHEET PAD SANDER | 108 |
| 555 | PLATE JOINER W/CASE | 159 |
| 690 | 1-1/2 HP ROUTER | 119 |

## DELTA

Delta 15" Hobby Scroll Saw

VARIABLE SPEED 1,100 to 2,000 STROKES PER MIN.
SIZE-8"x 9½"
TILT- 45° RIGHT OR LEFT
THROAT 15"
MODEL #40-500

SALE $88

## Milwaukee

ITEM #6511

2 SPEED SAWZALL
SALE $119

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 0228-1 | 3/8" DRILL 3.3A 0-1,000RPM | $ 92 |
| 0234-1 | 1/2" DRILL 4.5A MAGNUM 0-850RPM | 109 |
| 0235-1 | 1/2" 4.5A 0-850RPM KEYLESS MAGNUM DRILL | 119 |
| 1610-1 | 1/2" SUPER HOLE SHOOTER 650RPM | 144 |
| 1660-1 | 1/2" SUPER HOLE SHOOTER 450RPM | 152 |
| 1676-1 | 2 SP. HOLE HAWG W/CASE | 237 |
| 3002-1 | ELECTRICIANS RIGHT ANGLE DRILL KIT | 178 |
| 3102-1 | PLUMBERS RIGHT ANGLE DRILL KIT | 185 |
| 3107-1 | RIGHT ANGLE DRILL KIT VARIABLE SPEED | 189 |
| 5455 | POLISHER 1750RPM | 124 |
| 6014 | 1/2 SHEET ORBITAL SANDER | 109 |
| 6016 | 1/4 SHEET ORBITAL FINISH. SANDER | 43 |
| 6366 | 7-1/4 CIRCULAR SAW W/ACCESSORIES | 117 |
| 6507 | VAR. SP. SAWZALL W/CASE 7 BLADES & QUICK LOCK CORD | 129 |
| 6511 | 2 SP. SAWZALL W/CASE & 7 BLADES | 119 |
| 6539-1 | CORDLESS SCREWDRIVER W/BITS | 64 |
| 6543-1 | H.D. WOOD SCREW SHOOTER | 138 |
| 6750-1 | DRYWALL DRIVER 4.5A 0-4,000RPM | 88 |
| 6753-1 | DRYWALL DRIVER 3.5A 0-4,000RPM | 77 |
| 6793-1 | MAG TEK DRIVER 0-2,000RPM | 129 |
| 8975 | HEAVY DUTY HEAT GUN | 54 |

## makita

ITEM #6093DW

3/8 CORDLESS DRILL VARIABLE SPEED REVERSIBLE
SALE $119

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 6093DW | 3/8 CORDLESS DRILL VARIABLE SPEED REVERSIBLE | $119 |
| 6010DWK | 3/8 CORDLESS DRILL KIT 7.2V | 79 |
| 5090DW | 3-3/8 CORDLESS SAW KIT | 129 |
| DA3000DW | 3/8 CORDLESS ANGLE DRILL KIT, REVERSIBLE | 129 |
| DA3000R | 3/8 ANGLE DRILL, REVERSIBLE, 0-1400RPM | 129 |
| 632007-4 | 9.6V BATTERY | 30 |
| 632002-4 | 7.2V BATTERY | 28 |

33-pc. SCREWDRIVER BIT & SOCKET SET

Virtually every bit you'll ever need!

- Versatile Bit Set gives you the equivalent of a whole chest-full of screwdrivers. You'll never buy another screwdriver again!
- Operate by hand, with handle included-or as power-drivers in your electric drill

An incredible assortment. You get all of the most commonly used shapes and sizes

SALE $16.95

Industrial-quality construction.

1½ HP TWIN TANK HAND-CARRY COMPRESSOR

MADE IN U.S.A.

## Emglo

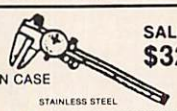
SALE $295

ITEM # AM78HC4

- COMPACT LIGHTWEIGHT
- DESIGNED TO YIELD 125 PSI
- OVERLOAD PROTECTED MOTOR
- CAST IRON CYLINDER INSURES LONGER LIFE
- COMES WITH PRESSURE SWITCH, ON/OFF SWITCH & AIR LINE REGULATOR

ITEM # 06DC

6" DIAL CALIPER IN WOODEN CASE



SALE $32

0-6"x0.001" STAINLESS STEEL

- OUTSIDE, INSIDE & DEPTH MEASUREMENTS
- DIAL READS DIRECTLY TO .001"
- LOCK FOR REPETITIVE SETTINGS
- CONVENIENT THUMB ROLL MAKES MEASURING QUICK & EASY
- SATIN CHROME FINISHED

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 12DC | 12" DIAL CALIPER 0-12.x0.001" | $78 |
| 06VC | 6" VENIER CALIPER STAINLESS STEEL .001" | 18 |
| 12VC | 12" VENIER CALIPER 0-12"x0.001" | 48 |

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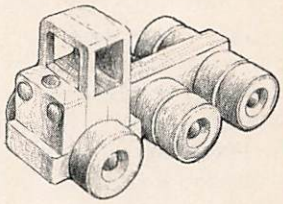
**TOOL CONNECTION**
**A DIVISION OF UNITED AMERICAN TRADE CORPORATION**


# TALKING BACK

*Continued from page 13*

## HEADWAY ON HEADLAMPS



I'm in the middle of building the lowboy tractor and dump truck from the August 1988 issue and have made some design changes. For example, I like ⅜" buttons for the head lights and radiator cap. And instead of a circle cutter to make the wheels, I used a 2⅛" hole cutter.

*—Richard M. Siefken, Tuscon, Ariz.*

## ENLIGHTENED PHONE NUMBER

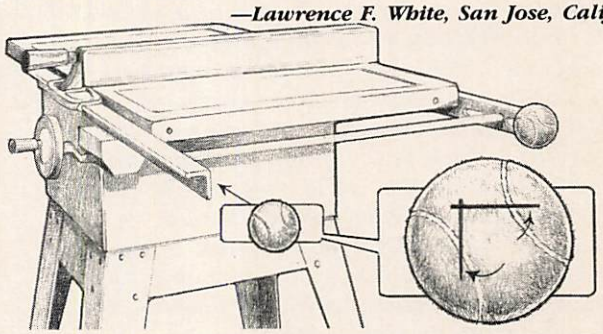
In the picture-framing article on page 47 of the October 1988, we incorrectly listed Light Impressions' phone number. The correct number is 716/271-8960.

## SHOP TIP SAVES A YOUNGSTER'S EYE

Woodworking has been my hobby for more than 20 years. I really would like to take this time to tell you that I think your magazine is the best. I read every magazine from cover to cover many times over.

Though many of your "Tips for Your Shop (And Ours)" are well known, some are new to me. I must tell you what happened in my shop just last week. I had just finished setting up my new table saw when I noticed the sharp ends of the fence rails. Then I remembered reading in your shop tips about covering the ends with slit tennis balls. Not an hour had passed after I installed the tennis balls when my 4-year-old grandson came in and walked right into the rail. The tennis ball saved his eye. Thank you and the person who sent in the tip.

*—Lawrence F. White, San Jose, Calif.*



*Larry, that tip which we published in February 1988 came from Jerry Swenson of Newport News, Va. Thank goodness you didn't delay putting the tennis balls to good use! Without tennis-ball protectors in our shop, we'd have plenty of staff members walking around with bruised thighs and patched trousers.*

*And speaking of shop tips, we know several readers who maintain a loose-leaf index of our shop tips filed by category (safety, gluing, finishing, and so forth). This provides a good way of quickly locating a tip. If you hesitate to clip your* WOOD *magazines, you may want to photocopy the shop-tip pages.*

# WOODWORKERS HARDWARE
## WHOLESALE ORDER FORM

Projects you can build in a single evening

Parts and Plans for making your own Musical Door Harps

### Grocery List Project

You can make these 16" high Grocery List Projects from standard 3/4" thick lumber.
We supply the Full Size blueprint together with enough Grocery Lists (500 sheets) and Brass Plated Bolt Sets (10 sets) to make 10 projects. Grocery Lists are 11" long and are printed on peach colored paper with a rich brown ink.
#7453 Country Grocery List Package.....$14.55/EA

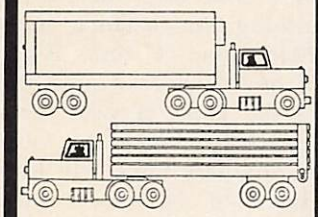
### Doll Stroller

Build this Doll Stroller from 3/4" pine and 1/4" plywood. Extremely easy to build from our Huge Plan Set. Fits 15" high dolls.
#W124 Doll Stroller Plan .....$3.50/EA

### Hardware Kit

Special Kit includes 4-1/2" stroller wheels, axles, wood spindles, screws, wood plugs, and dowel rod. Plan and other wood parts needed are not included with kit.
#1538 Doll Stroller Hardware Kit .....$5.22/EA

### Best Toy Truck Plans



Build from "2x4" and 3/4" stock. Huge 22" x 34" plans for 2 trucks.
#W144 Truck Plans.....$4.00/EA

### Truck Hardware Kit

46 piece kit includes 2" wood wheels, axle pegs, window decal set, and misc. wood turnings for head lights, clearance lights radiator cap, gas tanks, and differential cover. Enough hardware pieces to build one truck from plan above. Plan and other wood parts needed are not included with kit.
#1950 Truck Hardware Kit.....$7.50/EA

### Hardwood Toy Wheels

#W075100 3/4".....$3.50/100
#W087100 7/8".....$4.70/100
#W100100 1".....$6.00/100
#W125100 1-1/4"....$8.00/100
#W150100 1-1/2"..$11.00/100
#W175100 1-3/4"..$15.60/100
#W200100 2".....$19.50/100
#W22520 2-1/4".....$7.30/20
#W25020 2-1/2".....$8.80/20
#W27520 2-3/4".....$10.20/20

### Axle Pegs

#AP1 Fits 1"-2".....$4.10/100
#AP4 Fits 2-1/4" - 2-3/4".....$1.60/20

### 2" Wood Wheels With Tread Grooves

#705020 Front.....$6.30/20
#7050100.....$25.50/100
(Order #AP4 Peg for above)
#705120 Dual Rear.$10.50/20
#7051100.....$42.90/100
#AP5 Axle Pegs for Dual Rear Wheel.....$1.98/20
.....$9.00/100

### Birch Shaker Pegs

#7226 3-1/2".....$15.00/100
#7280 2-1/2".....$1.90/10
.....$13.90/100
#7227 1-3/4".....$1.10/10
.....$7.60/100

### Oak Shaker Pegs

#SKP2 3-1/2".....$3.35/10
.....$28.00/100
#7261 1-3/4".....$2.00/10
.....$15.00/100

### Mug Pegs

#MGP1 3-3/8".....$2.70/10
.....$25.00/100

### Birch Country Pegs

#1770 3-1/2".....$1.80/10
.....$13.00/100

### Birch Spindles

#S6 5-3/4".....$.49/ea
#S85 9".....$.85/ea
#S110 11".....$1.35/ea

### Birch Dowel Pins

#1142 1/4" x 2".....$1.90/100
.....$8.50/500
#1382 3/8" x 2".....$2.00/100
.....$9.25/500

### Oak or Birch Galley Spindles

Length

#S1 Birch 1-1/8".....$1.30/10
.....$9.00/100
#S4 Birch 1-1/2".....$1.70/10
.....$15.60/100
#S1OAK 1-1/8".....$1.50/10
.....$12.00/100
#S4OAK 1-1/2".....$2.40/10
.....$22.00/100

### Birch Screw Hole Buttons

#1432 3/8".....$1.76/100
.....$7.50/500
#1434 1/2".....$1.76/100
.....$8.00/500

### Oak Screw Hole Buttons

#1452 3/8".....$3.70/100
.....$15.50/500
#1454 1/2".....$3.80/100
.....$16.00/500

### Birch Candle Cups

#7290 1".....$2.00/10
.....$13.00/100
#CC1 1-1/2".....$2.90/10
.....$19.00/100

### 2" Brass Eagles

#878.....$2.49/10

### Quartz Clock Movement W/Hands

#Q82 1-4.....$6.48/ea
5-9.....$5.10/ea
10-24.....$4.55/ea
25 +.....$3.95/ea

### Push-Thru Lamp Socket

#940.....$1.59/ea

### Lazy Susan Bearings

#LC3 3".....$.95/ea
#LC4 4".....$1.25/ea
#LC6 6".....$2.25/ea
#12C 12".....$5.99/ea

### Clipboard Clips

#L5 3".....$.55/ea
#ST6 6".....$.75/ea

### Magnetic Strip

#120A 120" x 1/2"....$4.40/roll

### Paper Towel Roller

(spring loaded) #7238.....$1.19/ea

### Toy Train Plans

30"
#T55.....$6.99/set

### Picture Hangers

#S23 1-7/8".....$4.70/100

### Mini Hanger

#7247 5/8".....$2.60/100

### Saw Tooth Hangers

#S59 1-5/8".....$4.17/100
#S60 2-3/4".....$4.50/100
#406 Self-Fastening Hangers .....$4.77/100

### Prong Hanger

#7248.....$2.90/100

### Solid Brass Cup Hooks

#812 1/2".....$5.55/100
#858 5/8".....$6.30/100
#834 3/4".....$7.45/100

### 6" Brass & Porcelain Hooks

#6417 3 Prong.....$5.85/ea
#6416 2 Prong.....$2.97/ea

### Black Hammer Hinge w/Screws

#1730.....$1.62/2
.....$7.17/10

### Brass Plated Hinges

#910 1".....$1.49/10
#928 1-1/2".....$2.39/10

Screws for Above
#F124.....$2.40/100

### Production Screws

#6277 1-1/4" x #6.$1.70/100
#6278 1-5/8" x #6.$1.90/100
#6279 2" x #6.....$2.50/100
#6282 3" x #8.....$4.75/100

### 36" Birch Dowel

#7160 1/8".....$.70/5
.....$2.50/25
#7161 3/16".....$.90/5
.....$3.75/25
#7162 1/4".....$1.25/5
.....$5.00/25
#7163 5/16".....$1.50/5
.....$6.50/25
#7164 3/8".....$1.75/5
.....$7.50/25
#7166 1/2".....$2.50/5
.....$11.25/25
#7167 5/8".....$3.40/5
.....$16.25/25
#7168 3/4".....$5.25/5
.....$23.75/25

### Ceramic Knob w/Black Screw

#1661 3/4".....$.69/EA
.....$5.37/10
#1662 1".....$.79/EA
.....$5.90/10
#1663 1-1/4".....$.89/EA
.....$7.17/10

### Sanding Belt Cleaner 8"

#1710.....$5.37/ea

### GOOSE DOOR HARP KIT

Plan and Hardware Only

This kit contains all hardware and 1/8" plywood for building this loveable Goose Door Harp. Full Size plans. Project requires some 3/4" pine (not included). Kit is not precut, some sawing required. You get 8 tuning pins, music wire, 4 clapper balls, plastic eyes, 1/8" thick plywood for front and back, plus complete plans and instructions.
#7640 Goose Door Harp Kit .....$6.25/Kit

#W220 Plans for 6 Door Harps
$6.00 For all 6 Plans

### Door Harp Music Wire

Each string is approximately 36" long. Order at least one string for each door harp you want to build.
#7288 Door Harp Music Wire....$.35/EA
.....$3.00/10
.....$25.00/100

### Door Harp Tuning Pins

Nickel plated, approximately 1-3/4" long. Threaded end can be turned into 3/16" hole.
#7291 Door Harp Tuning Pins...$.35/EA
.....$3.00/10
.....$25.00/100

### Clapper Balls

#1342 3/4" Dia. Wood Ball.....$1.30/10
.....$9.90/100

### Door Harp Plywood

1/8" x 12" x 18" plywood, use for Front of Door Harp.
#7384 Plywood.....$3.00/Sheet
2-9 Sheets.....$2.40/Sheet
10-39 Sheets.....$2.00/Sheet

### Tuning Pin Wrench

#7445 Tuning Wrench
.....$9.95/EA

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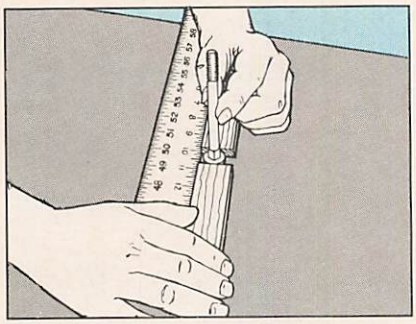
# TIPS FROM YOUR SHOP (AND OURS)

## TWO WAYS TO MEASURE DIAMETERS

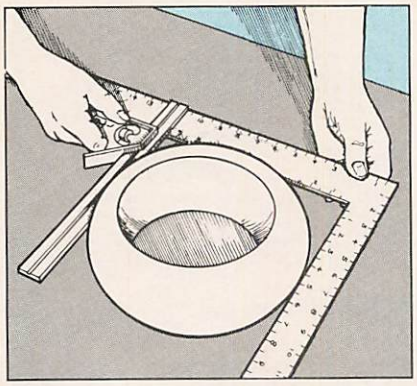
*Accurately measuring the diameter of an object smaller than 1" can be difficult if you don't have a calipers. Likewise, it's tough to determine the exact diameter of larger round objects.*

**TIP 1:** Use squarely cut wood strips and a ruler to determine the diameter of small objects, such as bolts or toy parts. Butt the two strips against the item you're measuring, and align one end with a mark on the scale as shown *below* to take your reading.



**TIP 2:** On larger objects, use two framing squares or a framing square and a combination square as shown *below* to determine the object's diameter. To ensure accuracy, measure the item twice.

***—Denis Marchand, Sherbrooke, Quebec, Canada***

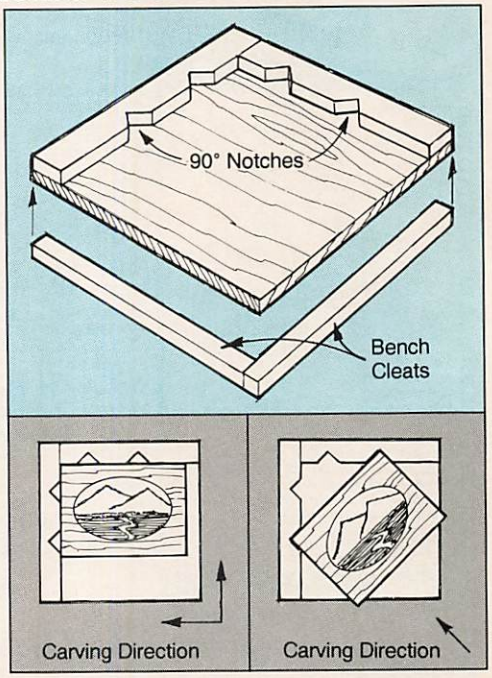


## BENCH HOOK SECURELY HOLDS WOODCARVING STOCK

*Relief carving requires using both hands on the carving tool. For comfort and safety, securing the carving on a tabletop helps greatly.*

**TIP:** You can easily make an inexpensive bench hook to hold carving pieces. Along two adjoining sides of a base of ¾" plywood, attach 1x2" rails with 90° notches cut to your needs. Fasten 1x2" cleats along two sides of the bottom of the base in the opposite corner from the notches. If possible, hold down the bench hook by securing one of the cleats in a vise. You can omit the bench cleats and clamp the assembly to your benchtop with C-clamps.

***—John Roccanova, Riverdale, N. Y.***

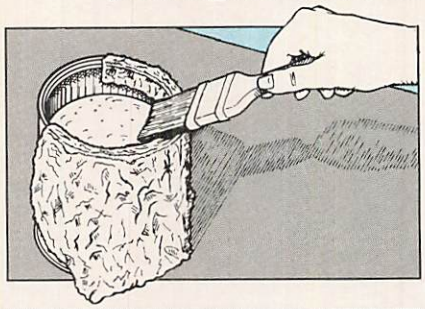



## PUT A BIB ON MESSY CONTACT CEMENT CANS

*Drippings from your brush can quickly coat the rim of a container and dry, making it practically impossible to put the lid back on tightly. A poor seal will allow air to harden the remaining cement.*

**TIP:** Form a piece of aluminum foil into place as a bib along at least half of the can's rim. This will catch the inevitable overflow of glue, preventing rim gum-up.

***—James Moffat, Allentown, Pa.***

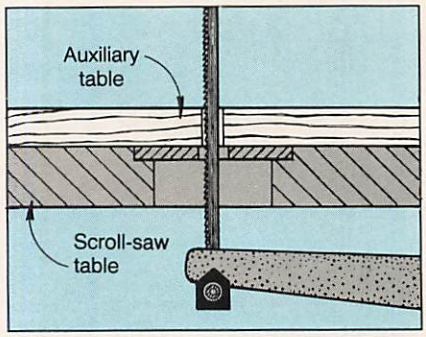


## GET EXTRA LIFE FROM SCROLL-SAW BLADES

*Normally, only about one-third of the length of a scroll saw blade is used. When that section becomes dull, nearly two-thirds of the blade remains sharp.*

**TIP:** Take advantage of the upper one-third of the blade by building an auxiliary table of a thickness of your choosing. For instance, make the auxiliary table ¾" thick if you cut a lot of ¾" stock. Clamp this spacer to the table of your scroll saw, or attach it with double-faced tape. The auxiliary table will limit the thickness of the material you can cut, but in most cases, the stock will be thin, anyway.

***—Elvin Perry, Manteca, Calif.***




Do you have any tips you'd like to share with our readers? We'll pay you $25 for each submission we publish. We cannot return any shop tips. Mail your tips to:

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**Better Homes and Gardens®**
***WOOD®* Magazine**
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**Des Moines, IA 50336**

*Continued on page 18*

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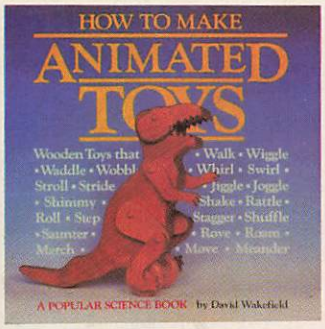


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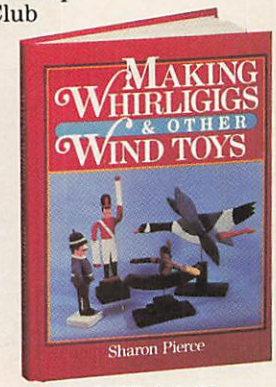


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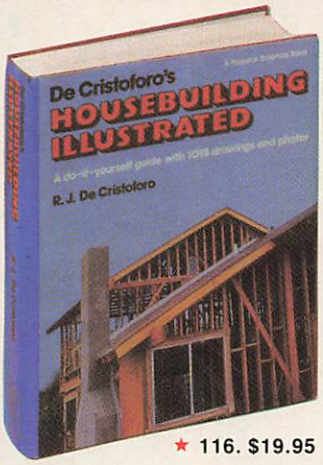
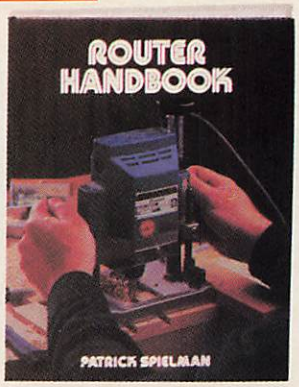



★ 116. $19.95

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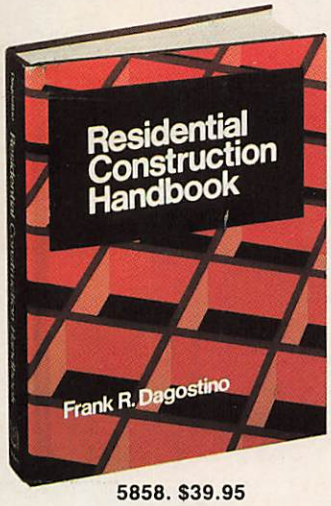


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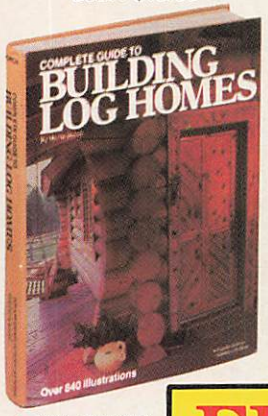


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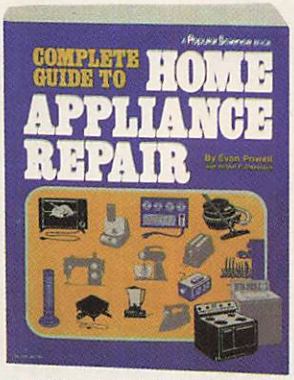


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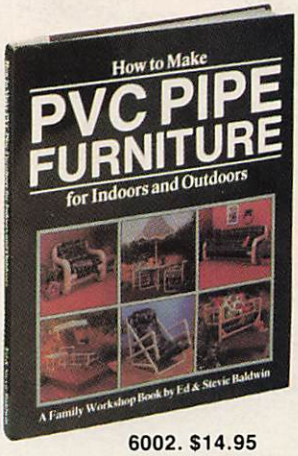


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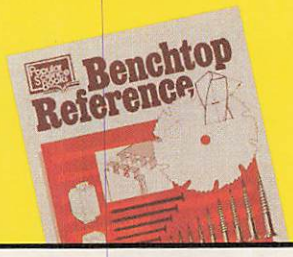


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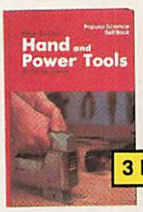


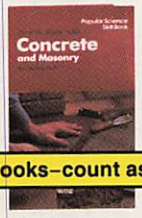


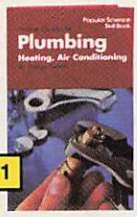


3 Books–count as 1

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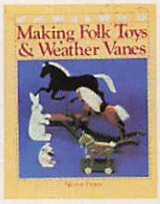


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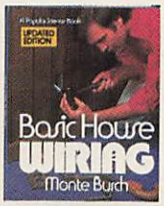


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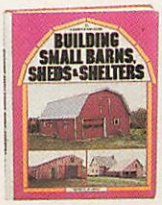


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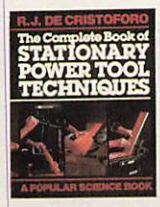


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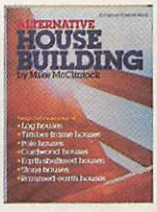


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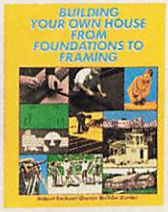


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# DESIGN-A-TOY™ CONTEST INFORMATION

*Continued from page 6*

| PRIZES | | |
|---|---|---|
| Divisions | Toys with Movable Parts | Toys Without Movable Parts |
| **Grand Prizes: $1,500 in merchandise** | | |
| School Age<br>Home Hobbyist<br>Professional | Total Shop<br>Foley Belsaw<br>AMI/Hegner | Black & Decker<br>Delta<br>Freud |
| **First Prizes: $250 in merchandise** | | |
| School Age<br>Home Hobbyist<br>Professional | Hitachi<br>Makita<br>Garrett Wade | Grizzly<br>Skil<br>Bosch |
| **Special Citations: $100 in merchandise (Five awards in each category)** | | |
| School Age | Formby's | DML |
| Home Hobbyist | Popular Science Book Club | Dremel |
| Professional | Woodmaster Tools | Minwax |
| All nonwinners eligible for drawing:<br>$1,400 Shopsmith Mark V 500 system<br>$1,000 in Porter-Cable merchandise<br>$500 in Ryobi merchandise<br>$250 in AEG merchandise<br>3 Ripstrates from Fisher-Hill Products | | |

## RULES

1. Toys must be your original design. A different approach to an existing toy would qualify. Please, do not not enter toys with only subtle changes from published patterns.
2. Make projects no larger than 24x24x24". The primary material should be wood, but may incorporate other materials. Examples of Toys With Movable Parts include pull toys and cars. Examples of Toys Without Movable Parts include puzzles and doll furniture.
3. Please follow Consumer Product Safety Commission guidelines:
- Nontoxic woods and wood finishes only;
- No parts smaller than 1¼" square on toys for children under 3 years of age;
- No sharp corners or points;
- Pull strings longer than 12" should not have beads or other attachments that could tangle and form a loop.

**Deadline:** Entries must be received by February 1, 1989 at Design-A-Toy™, WOOD® Magazine, 17th at Locust, Des Moines, IA 50336. All entries must be postpaid; collect entries will be refused. Attach an official entry label to each toy. Enter as many times as you wish. The entry label may be photocopied.

**Name** _____

**Phone:** Home ( ) _____ Work ( ) _____

**Address** _____

**City** _____

**State** _____ **Zip:** _____

I certify that I have designed and built this toy myself. Should my entry win, I agree to cooperate with WOOD magazine in supplying builder's notes and a bill of materials.

**Signature** _____ **Date:** _____


**MAKE BEAUTIFUL RAISED PANEL DOORS . . . WITH YOUR 1/4" ROUTER!**

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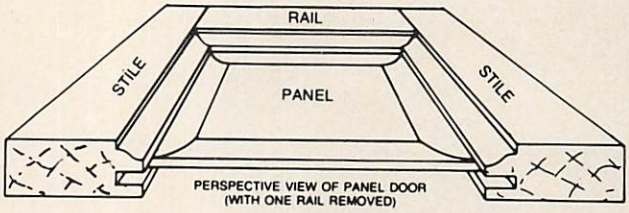
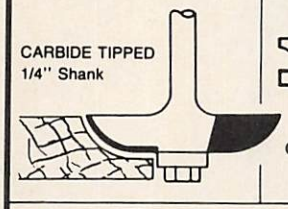
(Includes all bits shown)




PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

**RAISED PANEL BIT**
SUPPLIED WITH BALL BEARING

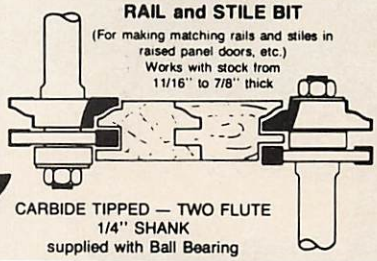
2" Large Diameter



CARBIDE TIPPED
1/4" Shank

**REVERSIBLE COMBINATION RAIL and STILE BIT**

(For making matching rails and stiles in raised panel doors, etc.)
Works with stock from 11/16" to 7/8" thick



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1/4" SHANK
supplied with Ball Bearing

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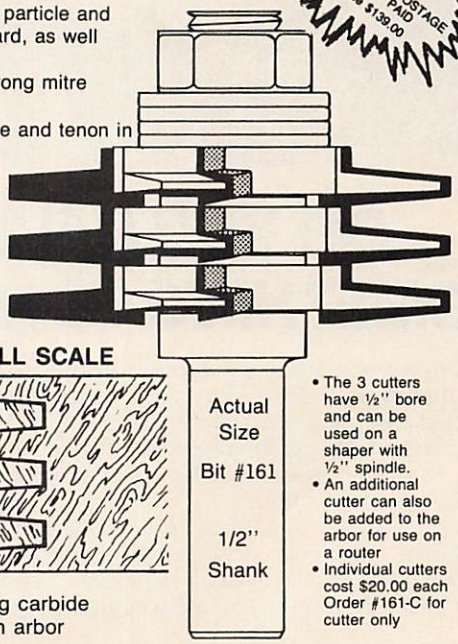
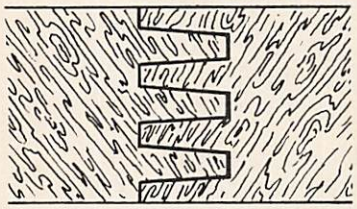
- Replaces mortise and tenon in many cases
- Quick and accurate set ups
- Joins 1/2" — 1" in one pass; 1" and up with multiple passes



FULL SCALE



Three 3-wing carbide cutters on arbor

Actual Size
Bit #161
1/2" Shank

- The 3 cutters have ½" bore and can be used on a shaper with ½" spindle.
- An additional cutter can also be added to the arbor for use on a router
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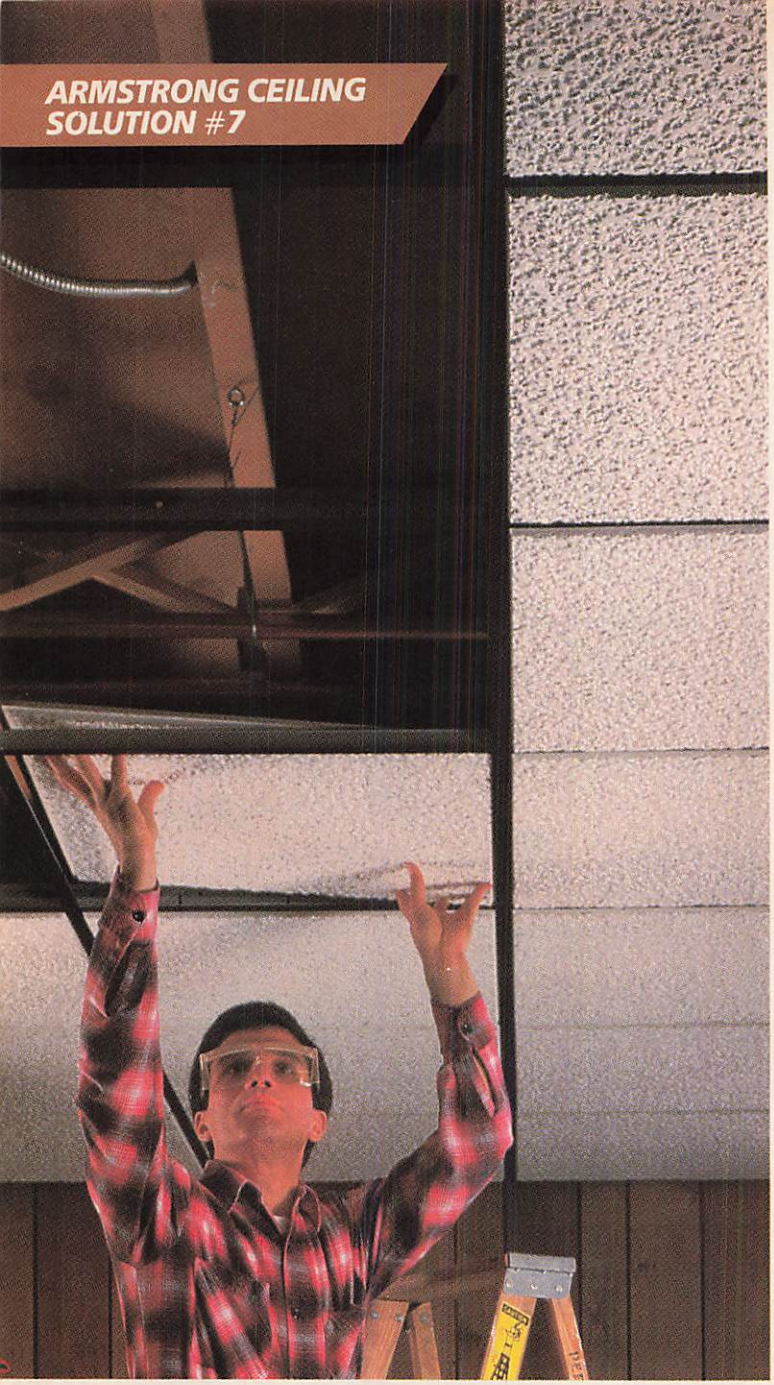


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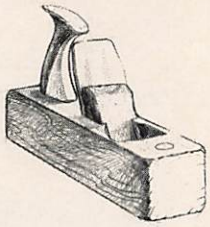
# TALKING BACK

**We welcome comments, criticisms, suggestions, and even an occasional compliment. The volume of mail we receive makes it impossible to answer every letter, but we promise to do our best. Send your correspondence to: Letters Editor, Better Homes and Gardens® WOOD® Magazine, Locust at 17th, Des Moines, IA 50336.**

## YES, YOU CAN MAKE HAND TOOLS

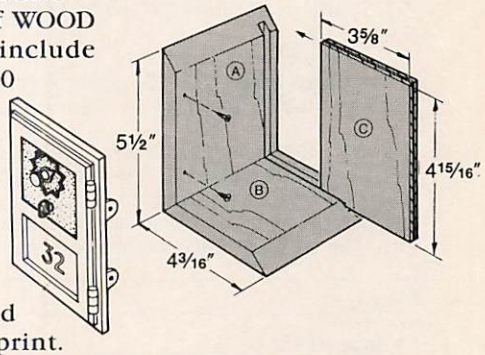


In response to Arkansas reader Carlton Measels (June 1988), I feel that there are times when a hand tool has advantages over a power tool. And, hand tools are quiet. The intimate knowledge gained by making a hand tool will help the woodworker use it with greater understanding and "feel" for the job. Enclosed is a list of resources that provide answers in learning ways to acquire or build your own tools.

***—Adam Chamberlain, Santa Clara, Calif.***

*Many thanks, Adam, for your list. Even a partial listing of your references is impossible in our limited space, but both you and reader Bob Null of Phoenix agree on a couple of worthy titles written by Alexander G. Weygers. Prentice Hall Press published both titles:* The Making of Tools, *($11.95) and* The Modern Blacksmith, *($10.95). Also consider a booklet by David G. Perch and Leonard G. Lee,* How to Make a Plane. *Write Garrett Wade Co., 161 Avenue of the Americas, New York, NY 10013; phone 800-221-2942 (N.Y. residents, 212/807-1757). The book, catalog no. 49L01, sells for $7.25 ppd.*

## CRACKING THE OAK SAFE DIMENSIONS




In every issue of WOOD magazine, we include well over 2,000 drawing labels and dimensions. And unfortunately, every once in a while an incorrect one slips through and makes it into print. That's what happened with the mini safe on page 78 of the October, 1988 issue. We built the project (two in fact), only to put a wrong dimension on the drawing. The length of the sides A should be 5½" instead of the 4½" shown on the drawing. And, the length of the box back (C) should be 4¹⁵⁄₁₆" instead of the 3¹⁵⁄₁₆" listed in the Bill of Materials.

We sincerely apologize for any inconvenience this may have caused you.

## IN SUPPORT OF LOGGERS

I enjoy your magazine very much, especially the article in the June 1988 issue on stave-bowl turning that shows the techniques involved in creating top-quality wood bowls. I hope your magazine will continue in this direction. However, what attracted my attention was the "Talking Back" letter and your excellent response concerning preserving the tropical rain forests.

Your response was that commercial harvesting of mahogany has little to do with the destruction of rain forests, but rather the conversion to agriculture, roads, and mining destroy the forests. I agree.

I live in a community where loggers harvest redwood trees for lumber. Here, the logging companies replant for future harvests. They primarily replant in areas cleared for temporary roads and work areas.

I write this because I continually see letters and articles unfairly attacking logging concerns. Most loggers have solid practices; they are in business to stay. I realize your magazine is not a political publication, but I wish to call your attention to the extensive destruction of forests around the world by those involved in illegal drugs.

Recently, for example, several of our government officials flew over large areas of Peru and were appalled at the destruction of forests—as far as the eye could see—for cocaine production. Those involved in illegal drugs could care less about our forests let alone human beings.

***—James D. Hooper, D.D.S., Fort Bragg, Calif.***

*We talked to Mitch Talcove, owner of a sawmill in Mexico and importer of exotic hardwood from Central America. Mitch, who lived for 8½ years in Mexico, believes some peasants grow marijuana or coca because of economic necessity. "It's the only way they can survive," Mitch says. "We say slashing and burning isn't good for the world, but they're thinking about their families. What would you do?*

*"You can't stop illegal people from doing everything. And there is no way we can stop deforestation. People down there believe they must slash the land to try to grow crops or graze cattle."*

*Although he has seen illegal slashing and burning right along the road, Mitch and other sawmill operators face stiff penalties and fines if they bring a dead or burned tree to a sawmill. By law, the Mexican forestry department must first mark each tree his company cuts and takes to the sawmill.*

*"Clear cutting and selectively harvesting hardwood are two different things," Mitch says. "Slashing and burning have nothing to do with the hardwood business. I often see a tree that's going to be burned, but I'm not allowed to use it!"*

*Continued on page 14*

Willow Square Tile

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| 1347 | 4-1/2 MINI GRINDER | 83 |
| 1604 | 1-3/4 HP ROUTER | 124 |
| 1611 | 3 HP PLUNGE ROUTER | 199 |
| 1608 | TRIM ROUTER | 79 |
| 1608L | LAMINATE TRIMMER | 83 |
| 1608T | TILT BASE LAM. TRIMMER | 89 |
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| TR12 | 3 H.P. PLUNGE ROUTER W/ACC | $164 |
| C10FA | DELUXE 10" MITER SAW | 264 |
| C15FB | DELUXE 15" MITER SAW | 369* |
| C8FB | 8½" COMPOUND MITER SAW | 539 |
| P100F | 12" PLANER | 998* |
| F1000A | 12" PLANER JOINER | 1348* |
| CB75F | BAND SAW ACCEPTS 1/4" TO 3" BLADES | 1498* |
| R100 | DUST COLLECTOR | 489* |
| 15-80AL | 15" CARBIDE BLADE 80T ALUM. | 80 |
| 15-110W | 15" CARBIDE BLADE 110T WOOD | 108 |
| 15-120P | 15" CARBIDE BLADE 120T PLASTIC | 108 |
| 998862 | 8-1/2" CARBIDE BLADE 60T FOR C8FB | 47 |

* FREIGHT COLLECT

**PORTER+CABLE**

ITEM #330
SALE
**$54**

**SPEED BLOCK FINISHING SANDER**

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 314 | 4-1/2" TRIM SAW | $124 |
| 330 | SPEED-BLOC FINISHING SANDER | 54 |
| 345 | 6" SAW BOSS | 98 |
| 352 | 3 x 21 DUSTLESS BELT SANDER | 127 |
| 360 | 3 x 24 DUSTLESS BELT SANDER | 184 |
| 362 | 4 x 24 DUSTLESS BELT SANDER | 197 |
| 505 | 1/2 SHEET PAD SANDER | 108 |
| 555 | PLATE JOINER W/CASE | 159 |
| 690 | 1-1/2 HP ROUTER | 119 |

**DELTA**

Delta 15" Hobby Scroll Saw

VARIABLE SPEED 1,100 to 2,000 STROKES PER MIN.
SIZE-8"x 9½"
TILT- 45° RIGHT OR LEFT
THROAT 15"
MODEL #40-500

SALE
**$88**

**Milwaukee**

ITEM #6511

**2 SPEED SAWZALL**

SALE
**$119**

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 0228-1 | 3/8" DRILL 3.3A 0-1,000RPM | $ 92 |
| 0234-1 | 1/2" DRILL 4.5A MAGNUM 0-850RPM | 109 |
| 0235-1 | 1/2" 4.5A 0-850RPM KEYLESS MAGNUM DRILL | 119 |
| 1610-1 | 1/2" SUPER HOLE SHOOTER 650RPM | 144 |
| 1660-1 | 1/2" SUPER HOLE SHOOTER 450RPM | 152 |
| 1676-1 | 2 SP. HOLE HAWG W/CASE | 237 |
| 3002-1 | ELECTRICIANS RIGHT ANGLE DRILL KIT | 178 |
| 3102-1 | PLUMBERS RIGHT ANGLE DRILL KIT | 185 |
| 3107-1 | RIGHT ANGLE DRILL KIT VARIABLE SPEED | 189 |
| 5455 | POLISHER 1750RPM | 124 |
| 6014 | 1/2 SHEET ORBITAL SANDER | 109 |
| 6016 | 1/4 SHEET ORBITAL FINISH. SANDER | 43 |
| 6366 | 7-1/4 CIRCULAR SAW W/ACCESSORIES | 117 |
| 6507 | VAR. SP. SAWZALL W/CASE 7 BLADES & QUICK LOCK CORD | 129 |
| 6511 | 2 SP. SAWZALL W/CASE & 7 BLADES | 119 |
| 6539-1 | CORDLESS SCREWDRIVER W/BITS | 64 |
| 6543-1 | H.D. WOOD SCREW SHOOTER | 138 |
| 6750-1 | DRYWALL DRIVER 4.5A 0-4,000RPM | 88 |
| 6753-1 | DRYWALL DRIVER 3.5A 0-4,000RPM | 77 |
| 6793-1 | MAG TEK DRIVER 0-2,000RPM | 129 |
| 8975 | HEAVY DUTY HEAT GUN | 54 |

**makita**

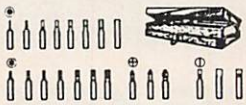
ITEM #6093DW

**3/8 CORDLESS DRILL VARIABLE SPEED REVERSIBLE**

SALE
**$119**

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 6093DW | 3/8 CORDLESS DRILL VARIABLE SPEED REVERSIBLE | $119 |
| 6010DWK | 3/8 CORDLESS DRILL KIT 7.2V | 79 |
| 5090DW | 3-3/8 CORDLESS SAW KIT | 129 |
| DA3000DW | 3/8 CORDLESS ANGLE DRILL KIT, REVERSIBLE | 129 |
| DA3000R | 3/8 ANGLE DRILL, REVERSIBLE, 0-1400RPM | 129 |
| 632007-4 | 9.6V BATTERY | 30 |
| 632002-4 | 7.2V BATTERY | 28 |

33-pc. SCREWDRIVER BIT & SOCKET SET



Virtually every bit you'll ever need!

- Versatile Bit Set gives you the equivalent of a whole chest-full of screwdrivers. You'll never buy another screwdriver again!
- Operate by hand, with handle included-or as power-drivers in your electric drill

An incredible assortment. You get all of the most commonly used shapes and sizes

SALE
**$16.95**

Industrial-quality construction.

**1½ HP TWIN TANK HAND-CARRY COMPRESSOR**

MADE IN U.S.A.

**Emglo**

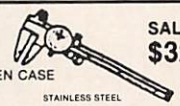
SALE
**$295**

ITEM #AM78HC4

- COMPACT LIGHTWEIGHT
- DESIGNED TO YIELD 125 PSI
- OVERLOAD PROTECTED MOTOR
- CAST IRON CYLINDER INSURES LONGER LIFE
- COMES WITH PRESSURE SWITCH, ON/OFF SWITCH & AIR LINE REGULATOR

ITEM # 06DC

**6" DIAL CALIPER IN WOODEN CASE**



SALE
**$32**

0-6"x0.001" STAINLESS STEEL

- OUTSIDE, INSIDE & DEPTH MEASUREMENTS
- DIAL READS DIRECTLY TO .001"
- LOCK FOR REPETITIVE SETTINGS
- CONVENIENT THUMB ROLL MAKES MEASURING QUICK & EASY
- SATIN CHROME FINISHED

| ITEM # | DESCRIPTION | SALE |
|---|---|---|
| 12DC | 12" DIAL CALIPER 0-12.x0.001" | $78 |
| 06VC | 6" VENIER CALIPER STAINLESS STEEL .001" | 18 |
| 12VC | 12" VENIER CALIPER 0-12"x0.001" | 48 |

MAIL ORDERS TO: TOOL CONNECTION
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CONCORD, CA 94520

ORDERS PLACED BY VISA, MASTERCARD, CASHIER CHECKS OR MONEY ORDERS WILL BE SHIPPED THE SAME DAY. ALLOW 2 WEEKS FOR PERSONAL OR COMPANY CHECKS. CA. RESIDENTS ADD 6.5% SALES TAX.

NO COD'S PLEASE - ERRORS SUBJECT TO CORRECTION.
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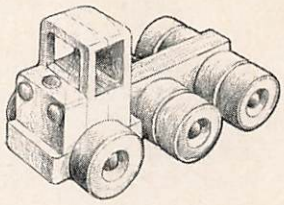
**TOOL CONNECTION**
**A DIVISION OF UNITED AMERICAN TRADE CORPORATION**


# TALKING BACK

*Continued from page 13*

## HEADWAY ON HEADLAMPS



I'm in the middle of building the lowboy tractor and dump truck from the August 1988 issue and have made some design changes. For example, I like ⅜" buttons for the head lights and radiator cap. And instead of a circle cutter to make the wheels, I used a 2⅛" hole cutter.

***—Richard M. Siefken, Tuscon, Ariz.***

## ENLIGHTENED PHONE NUMBER

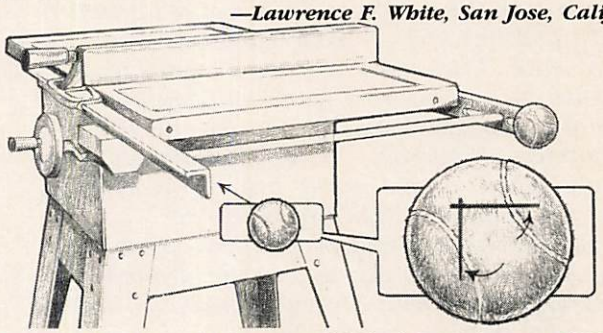
In the picture-framing article on page 47 of the October 1988, we incorrectly listed Light Impressions' phone number. The correct number is 716/271-8960.

## SHOP TIP SAVES A YOUNGSTER'S EYE

Woodworking has been my hobby for more than 20 years. I really would like to take this time to tell you that I think your magazine is the best. I read every magazine from cover to cover many times over.

Though many of your "Tips for Your Shop (And Ours)" are well known, some are new to me. I must tell you what happened in my shop just last week. I had just finished setting up my new table saw when I noticed the sharp ends of the fence rails. Then I remembered reading in your shop tips about covering the ends with slit tennis balls. Not an hour had passed after I installed the tennis balls when my 4-year-old grandson came in and walked right into the rail. The tennis ball saved his eye. Thank you and the person who sent in the tip.

***—Lawrence F. White, San Jose, Calif.***



*Larry, that tip which we published in February 1988 came from Jerry Swenson of Newport News, Va. Thank goodness you didn't delay putting the tennis balls to good use! Without tennis-ball protectors in our shop, we'd have plenty of staff members walking around with bruised thighs and patched trousers.*

*And speaking of shop tips, we know several readers who maintain a loose-leaf index of our shop tips filed by category (safety, gluing, finishing, and so forth). This provides a good way of quickly locating a tip. If you hesitate to clip your* WOOD *magazines, you may want to photocopy the shop-tip pages.*

# WOODWORKERS HARDWARE
## WHOLESALE ORDER FORM

Projects you can build in a single evening

Parts and Plans for making your own Musical Door Harps

### Grocery List Project

You can make these 16" high Grocery List Projects from standard 3/4" thick lumber.
We supply the Full Size blueprint together with enough Grocery Lists (500 sheets) and Brass Plated Bolt Sets (10 sets) to make 10 projects. Grocery Lists are 11" long and are printed on peach colored paper with a rich brown ink.
#7453 Country Grocery List Package.....$14.55/EA

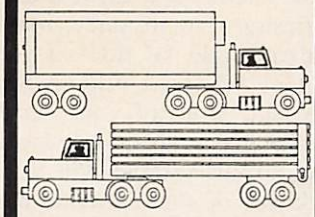
### Doll Stroller

Build this Doll Stroller from 3/4" pine and 1/4" plywood. Extremely easy to build from our Huge Plan Set. Fits 15" high dolls.
#W124 Doll Stroller Plan .....$3.50/EA

### Hardware Kit

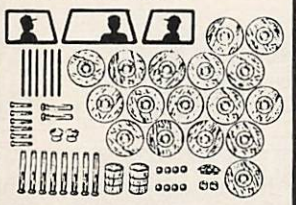
Special Kit includes 4-1/2" stroller wheels, axles, wood spindles, screws, wood plugs, and dowel rod. Plan and other wood parts needed are not included with kit.
#1538 Doll Stroller Hardware Kit .....$5.22/EA

### Best Toy Truck Plans



Build from "2x4" and 3/4" stock. Huge 22" x 34" plans for 2 trucks.
#W144 Truck Plans.....$4.00/EA

### Truck Hardware Kit



46 piece kit includes 2" wood wheels, axle pegs, window decal set, and misc. wood turnings for head lights, clearance lights radiator cap, gas tanks, and differential cover. Enough hardware pieces to build one truck from plan above. Plan and other wood parts needed are not included with kit.
#1950 Truck Hardware Kit.....$7.50/EA

### Hardwood Toy Wheels

#W075100 3/4".....$3.50/100
#W087100 7/8".....$4.70/100
#W100100 1".....$6.00/100
#W125100 1-1/4".....$8.00/100
#W150100 1-1/2".....$11.00/100
#W175100 1-3/4".....$15.60/100
#W200100 2".....$19.50/100
#W22520 2-1/4".....$7.30/20
#W25020 2-1/2".....$8.80/20
#W27520 2-3/4".....$10.20/20

### Axle Pegs

#AP1 Fits 1"-2".....$4.10/100
#AP4 Fits 2-1/4" - 2-3/4".....$1.60/20

### 2" Wood Wheels With Tread Grooves

#705020 Front.....$6.30/20
#7050100.....$25.50/100
(Order #AP4 Peg for above)
#705120 Dual Rear.$10.50/20
#7051100.....$42.90/100
#AP5 Axle Pegs for Dual Rear Wheel.....$1.98/20
.....$9.00/100

### Birch Shaker Pegs

#7226 3-1/2".....$15.00/100
#7280 2-1/2".....$1.90/10
.....$13.90/100
#7227 1-3/4".....$1.10/10
.....$7.60/100

### Oak Shaker Pegs

#SKP2 3-1/2".....$3.35/10
.....$28.00/100
#7261 1-3/4".....$2.00/10
.....$15.00/100

### Mug Pegs

#MGP1 3-3/8".....$2.70/10
.....$25.00/100

### Birch Country Pegs

#1770 3-1/2".....$1.80/10
.....$13.00/100

### Birch Spindles

#S6 5-3/4".....$.49/ea
#S85 9".....$.85/ea
#S110 11".....$1.35/ea

### Birch Dowel Pins

#1142 1/4" x 2".....$1.90/100
.....$8.50/500
#1382 3/8" x 2".....$2.00/100
.....$9.25/500

### Oak or Birch Galley Spindles

#S1 Birch 1-1/8".....$1.30/10
.....$9.00/100
#S4 Birch 1-1/2".....$1.70/10
.....$15.60/100
#S1OAK 1-1/8".....$1.50/10
.....$12.00/100
#S4OAK 1-1/2".....$2.40/10
.....$22.00/100

### Birch Screw Hole Buttons

#1432 3/8".....$1.76/100
.....$7.50/500
#1434 1/2".....$1.76/100
.....$8.00/500

### Oak Screw Hole Buttons

#1452 3/8".....$3.70/100
.....$15.50/500
#1454 1/2".....$3.80/100
.....$16.00/500

### Birch Candle Cups

#7290 1".....$2.00/10
.....$13.00/100
#CC1 1-1/2".....$2.90/10
.....$19.00/100

### 2" Brass Eagles

#878.....$2.49/10

### Quartz Clock Movement W/Hands

#Q82 1-4.....$6.48/ea
5-9.....$5.10/ea
10-24.....$4.55/ea
25 +.....$3.95/ea

### Push-Thru Lamp Socket

#940.....$1.59/ea

### Lazy Susan Bearings

#LC3 3".....$.95/ea
#LC4 4".....$1.25/ea
#LC6 6".....$2.25/ea
#12C 12".....$5.99/ea

### Clipboard Clips

#L5 3".....$.55/ea
#ST6 6".....$.75/ea

### Magnetic Strip

#120A 120" x 1/2"....$4.40/roll

### Paper Towel Roller

(spring loaded) #7238.....$1.19/ea

### Toy Train Plans

30"
#T55.....$6.99/set

### Picture Hangers

#S23 1-7/8".....$4.70/100

### Mini Hanger

#7247 5/8".....$2.60/100

### Saw Tooth Hangers

#S59 1-5/8".....$4.17/100
#S60 2-3/4".....$4.50/100
#406 Self-Fastening Hangers
.....$4.77/100

### Prong Hanger

#7248.....$2.90/100

### Solid Brass Cup Hooks

#812 1/2".....$5.55/100
#858 5/8".....$6.30/100
#834 3/4".....$7.45/100

### 6" Brass & Porcelain Hooks

#6417 3 Prong.....$5.85/ea
#6416 2 Prong.....$2.97/ea

### Black Hammer Hinge w/Screws

#1730.....$1.62/2
.....$7.17/10

### Brass Plated Hinges

#910 1".....$1.49/10
#928 1-1/2".....$2.39/10
Screws for Above
#F124.....$2.40/100

### Production Screws

#6277 1-1/4" x #6.$1.70/100
#6278 1-5/8" x #6.$1.90/100
#6279 2" x #6.....$2.50/100
#6282 3" x #8.....$4.75/100

### 36" Birch Dowel

#7160 1/8".....$.70/5
.....$2.50/25
#7161 3/16".....$.90/5
.....$3.75/25
#7162 1/4".....$1.25/5
.....$5.00/25
#7163 5/16".....$1.50/5
.....$6.50/25
#7164 3/8".....$1.75/5
.....$7.50/25
#7166 1/2".....$2.50/5
.....$11.25/25
#7167 5/8".....$3.40/5
.....$16.25/25
#7168 3/4".....$5.25/5
.....$23.75/25

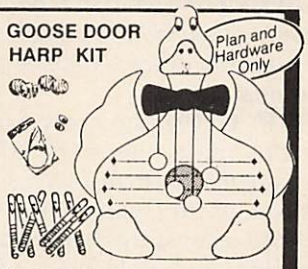
### Ceramic Knob w/Black Screw

#1661 3/4".....$.69/EA
.....$5.37/10
#1662 1".....$.79/EA
.....$5.90/10
#1663 1-1/4".....$.89/EA
.....$7.17/10

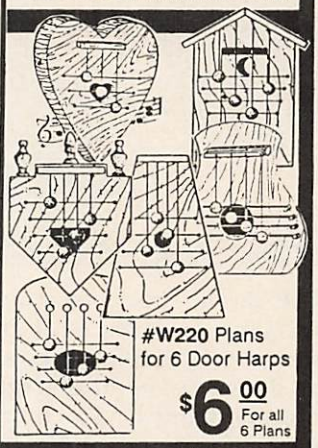
### Sanding Belt Cleaner 8"

#1710.....$5.37/ea

### GOOSE DOOR HARP KIT




This kit contains all hardware and 1/8" plywood for building this loveable Goose Door Harp. Full Size plans. Project requires some 3/4" pine (not included). Kit is not precut, some sawing required. You get 8 tuning pins, music wire, 4 clapper balls, plastic eyes, 1/8" thick plywood for front and back, plus complete plans and instructions.
#7640 Goose Door Harp Kit.....$6.25/Kit



#W220 Plans for 6 Door Harps
$6.00 For all 6 Plans

### Door Harp Music Wire

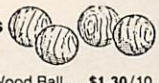
Each string is approximately 36" long. Order at least one string for each door harp you want to build.
#7288 Door Harp Music Wire....$.35/EA
.....$3.00/10
.....$25.00/100

### Door Harp Tuning Pins



Nickel plated, approximately 1-3/4" long. Threaded end can be turned into 3/16" hole.
#7291 Door Harp Tuning Pins...$.35/EA
.....$3.00/10
.....$25.00/100

### Clapper Balls



#1342 3/4" Dia. Wood Ball.....$1.30/10
.....$9.90/100

### Door Harp Plywood

1/8" x 12" x 18" plywood, use for Front of Door Harp.
#7384 Plywood.....$3.00/Sheet
2-9 Sheets.....$2.40/Sheet
10-39 Sheets.....$2.00/Sheet

### Tuning Pin Wrench

#7445 Tuning Wrench
.....$9.95/EA

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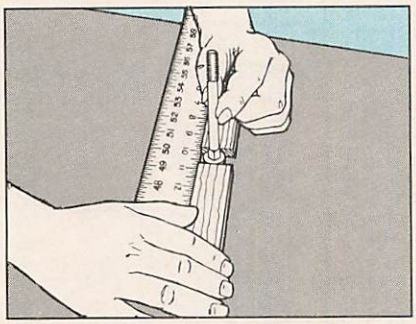
**MEISEL HARDWARE SPECIALTIES** P.O. BOX 70 W-12 MOUND, MN 55364

## TWO WAYS TO MEASURE DIAMETERS

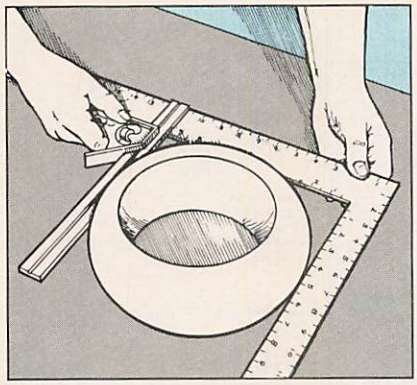
*Accurately measuring the diameter of an object smaller than 1" can be difficult if you don't have a calipers. Likewise, it's tough to determine the exact diameter of larger round objects.*

**TIP 1:** Use squarely cut wood strips and a ruler to determine the diameter of small objects, such as bolts or toy parts. Butt the two strips against the item you're measuring, and align one end with a mark on the scale as shown *below* to take your reading.



**TIP 2:** On larger objects, use two framing squares or a framing square and a combination square as shown *below* to determine the object's diameter. To ensure accuracy, measure the item twice.

*—Denis Marchand, Sherbrooke, Quebec, Canada*

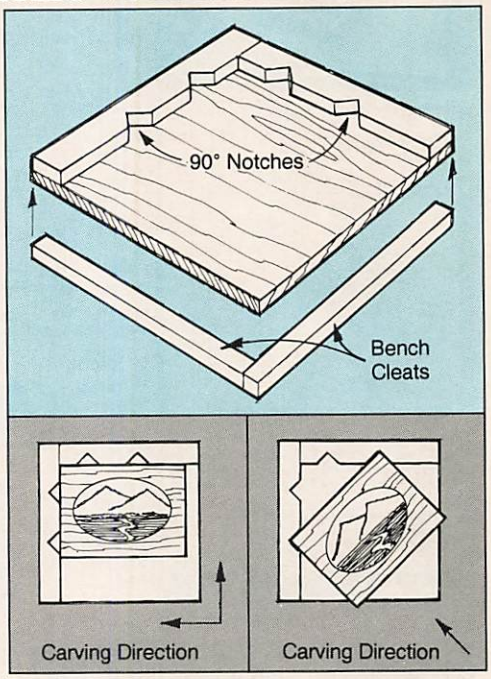


## BENCH HOOK SECURELY HOLDS WOODCARVING STOCK

*Relief carving requires using both hands on the carving tool. For comfort and safety, securing the carving on a tabletop helps greatly.*

**TIP:** You can easily make an inexpensive bench hook to hold carving pieces. Along two adjoining sides of a base of ¾" plywood, attach 1x2" rails with 90° notches cut to your needs. Fasten 1x2" cleats along two sides of the bottom of the base in the opposite corner from the notches. If possible, hold down the bench hook by securing one of the cleats in a vise. You can omit the bench cleats and clamp the assembly to your benchtop with C-clamps.

*—John Roccanova, Riverdale, N. Y.*

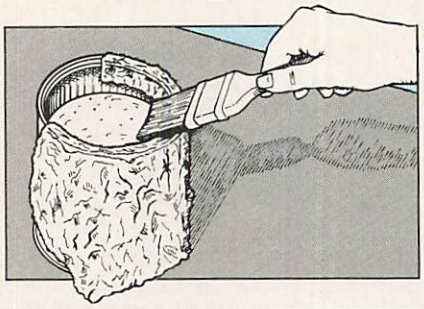



## PUT A BIB ON MESSY CONTACT CEMENT CANS

*Drippings from your brush can quickly coat the rim of a container and dry, making it practically impossible to put the lid back on tightly. A poor seal will allow air to harden the remaining cement.*

**TIP:** Form a piece of aluminum foil into place as a bib along at least half of the can's rim. This will catch the inevitable overflow of glue, preventing rim gum-up.

*—James Moffat, Allentown, Pa.*

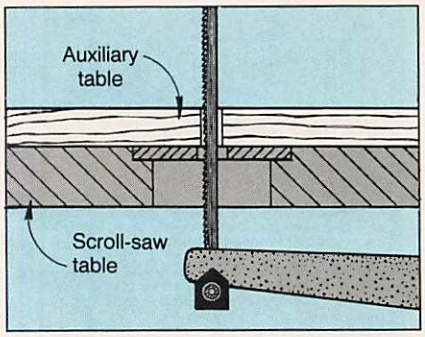


## GET EXTRA LIFE FROM SCROLL-SAW BLADES

*Normally, only about one-third of the length of a scroll saw blade is used. When that section becomes dull, nearly two-thirds of the blade remains sharp.*

**TIP:** Take advantage of the upper one-third of the blade by building an auxiliary table of a thickness of your choosing. For instance, make the auxiliary table ¾" thick if you cut a lot of ¾" stock. Clamp this spacer to the table of your scroll saw, or attach it with double-faced tape. The auxiliary table will limit the thickness of the material you can cut, but in most cases, the stock will be thin, anyway.

*—Elvin Perry, Manteca, Calif.*

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*Continued on page 18*

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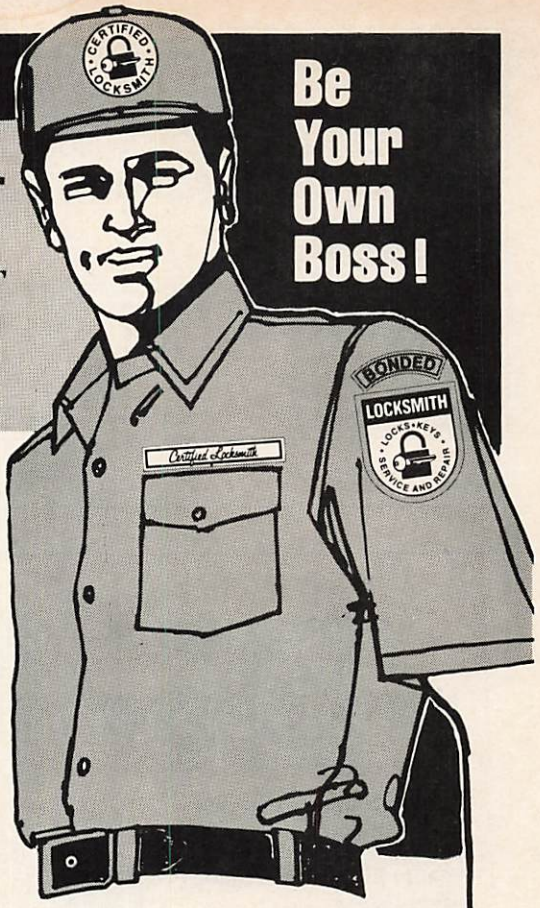


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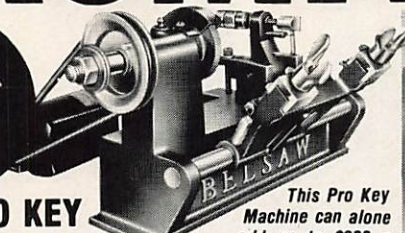


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## TIPS FROM YOUR SHOP (AND OURS)

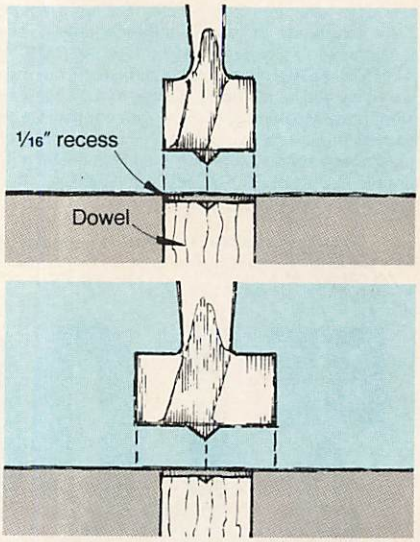
*Continued from page 16*

### HERE'S HOW TO CENTER A BIT IN AN EXISTING HOLE

*Enlarging a hole in wood or other material requires a lot of guesswork to start the bit in the exact center.*

**TIP:** Insert a scrap of dowel the diameter of the existing hole and slightly recessed—about 1/16". Fit a drill bit the same size of the hole into the recess and tap the end of the shank just hard enough to mark the dowel center. Use this mark to start drilling the larger hole.

***—Ed Good, Nordland, Wash.***

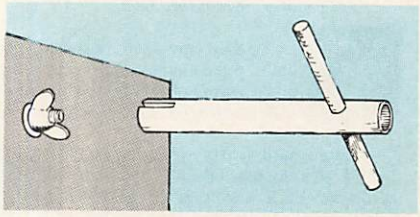



### LOOSEN WING NUTS

*A tight wing nut can chew up fingers before you get it loosened.*

**TIP:** Make a special wrench out of a 12" length of 1/2"-diameter electrical conduit and a 4" length of 1/4" steel rod. With a hacksaw, cut notches 3/16" wide and 1/2" deep in one end of the conduit, as shown below. About 3/4" from the opposite end, drill a 1/4" hole, insert the steel rod, and glue in place with epoxy. Keep one wrench with your router table.

***—Lloyd T. Murphy***
***Oak Ridge, Tenn.***



*Continued on page 20*

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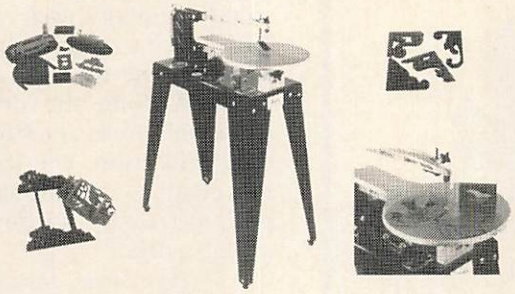

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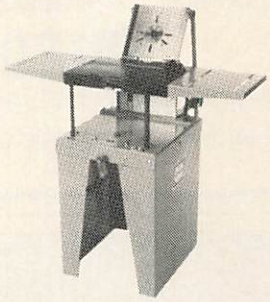

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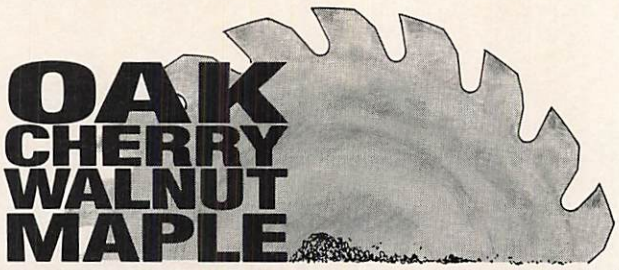


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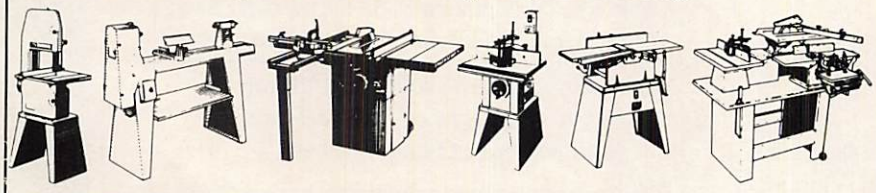

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## TIPS FROM YOUR SHOP (AND OURS)

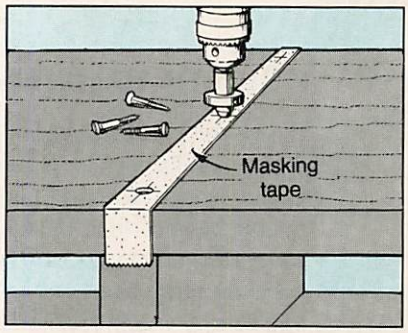
*continued from page 18*

### QUICK, CLEAN DRILLING GUIDE

*It's a challenge to center the holes on the opposite side of a butt or dado joint for a divider or shelf. You can mark the line with a faint pencil mark, but you'll do extra sanding on the unfinished wood to remove each mark.*

**TIP:** Place a strip of masking tape matching the width of the divider or shelf along the desired line, mark the hole locations on it, then drill away. The tape reduces the chances of chipping, and it pulls off easily without leaving layout marks.

***—Don Oliver, Nederland, Texas***

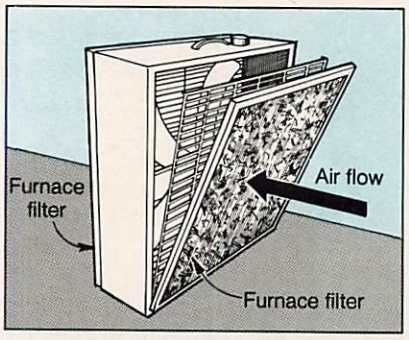



### MINI DUST COLLECTOR

*Sawing and sanding operations generate a lot of irritating fine dust in the workshop.*

**TIP:** Installing furnace filters on both sides of a box fan offers an inexpensive way to gather up dust. Use wire to hold the filters in place, and position the fan adjacent to the work area so it pulls air away from you. Clean the filters with a shop vacuum when they become dust-filled.

***—James R. Losbinsky, Youngstown, Ohio***




*Continued on page 22*

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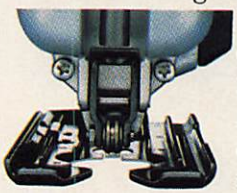

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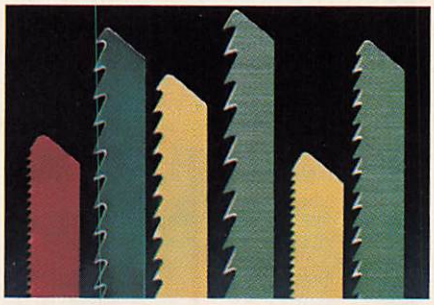

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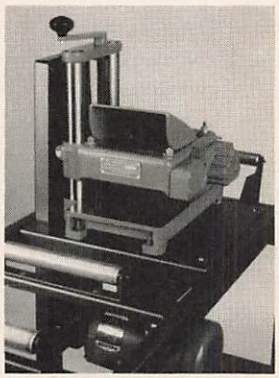

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## TIPS FROM YOUR SHOP (AND OURS)

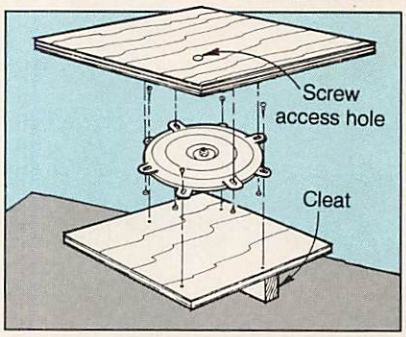
*Continued from page 20*

### A HANDY LAZY SUSAN

*Moving around your project while finishing can become bothersome.*

**TIP:** A turntable allows you to stand in one spot and move the work into range. From ¾" plywood, cut pieces measuring 24×24" and 15×15". Fasten a 6" ballbearing heavy-duty lazy susan fixture (available at many hardware stores) to the bottom of the larger piece. Then, fasten this assembly to the smaller piece. Add a 2×4×15" piece to the center of the bottom side of the base to secure the turntable in a vise.

***—George A. Heffelfinger, Lebighton, Pa.***

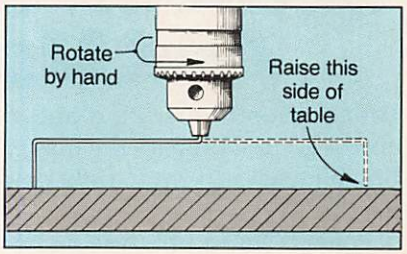



### LEVELING WITH A WIRE

*Squaring up a tilting table on a drill press so it's perpendicular to a drill bit can prove tedious.*

**TIP:** Instead of using a square, a small length of coat hanger or other stiff wire will do the job quickly and accurately. Cut a length of wire approximately 6" long, and bend right angles in it as shown. Don't worry if the angles aren't exactly 90°. Chuck one end into the drill and tighten. Raise the table so it barely touches the wire. Slowly rotate the drill chuck 180° by hand so you can detect any high or low spots in the table.

***—John Clark, Cuddebackville, N.Y.***

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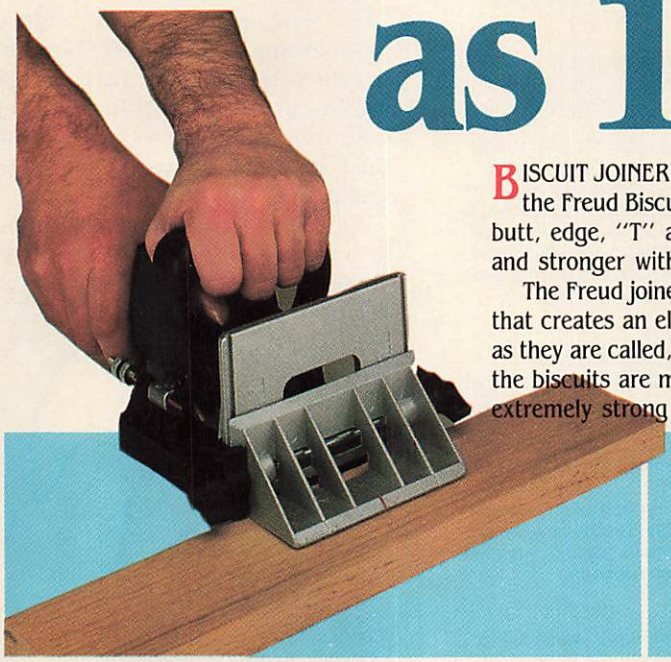
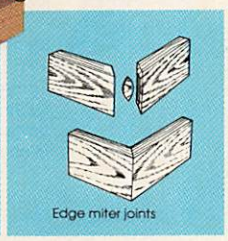
# FREUD'S BISCUIT JOINER:

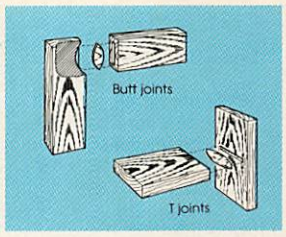
# It Works as Easy as 1·2·3



BISCUIT JOINERY is now easy and economical with the Freud Biscuit Joiner machine. Joints, such as butt, edge, "T" and others, can be made quicker and stronger with the use of the Freud joiner.

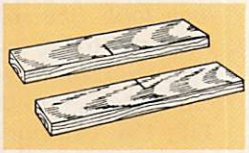
The Freud joinery machine is a plunge cutting tool. It has a rotating carbide cutter that creates an eliptical slot in the surfaces to be joined. The splines, or "biscuits" as they are called, are inserted into the slot along with any water based glue. Because the biscuits are made of wood, the water makes them swell in the joint making an extremely strong and firm bond.



## 1 Lay Out

The boards that are to be joined should be placed together and the location of each joint marked on both pieces. The vertical fence is adjusted to the depth desired for the slots. Turning the wing nuts on the side of the fence allows it to move easily in the tracks. The fence is accurately calibrated to allow you to easily move it to center of the joint *(See Figure 1).*



At this point, you have determined the horizontal location of the joint by marking the wood and vertical location of the joint by setting the fence.

## 2 Cut

*You are now ready to make the slots for your biscuit joint.*

There is a red indicator line on the front of the fence and a corresponding red mark on the base plate *(See Figure 1).* You can use either of these marks for alignment with the lines drawn on the mating pieces of wood.

With the wood securely held in place, align the red mark with the line on the board. With one hand you can grasp the body of the machine. The other hand is placed on the handle. Turn the machine on and, with a steady forward motion, push the joiner body forward to make the biscuit slot. Repeat the process for each marked area on all of the wood pieces.

*Simple and Easy!!!* The wood particles are automatically ejected through the machine's exhaust port.

## 3 Assemble

Apply a water based glue to the slots and surfaces being joined. Insert the biscuits in the slots and push the boards together. For best results you will need to clamp the joint together for the glue manufacturer's recommended drying time.

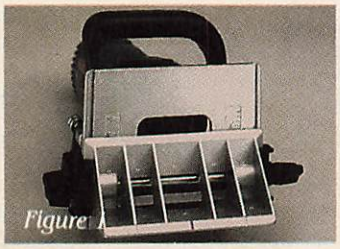
There you have it, 1-2-3!! An extremely strong joint produced quickly and easily by you and the Freud Joiner Machine.

You will find a complete instruction "How to" book with each machine. Illustrated with photographs and drawings, it is designed for those woodworkers not familiar with biscuit joinery. The Freud biscuit joiner will prove to be a highly valued tool for your woodworking projects.

*At a List price of $285.55, the Freud JS100 Joiner Machine is now on sale through your local Freud distributor for $195.00.*

MITER JOINTS? NO PROBLEM!

*By reversing the fence, you can join mitered pieces* (See Figure 2). *The steps are the same.*




*Mark the location of your joint and set the fence to the vertical height needed. Line up the fence with the mark and make your cut. Apply glue — insert biscuits — clamp!*

*Booklet*

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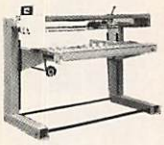

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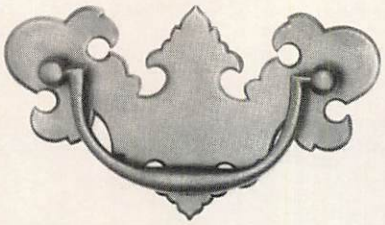

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## TIPS FROM YOUR SHOP (AND OURS)

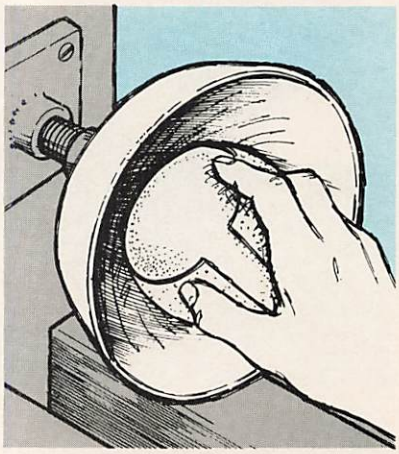
*Continued from page 22*

### "ON-THE-BALL" SANDING

*Smoothly sanding the inside of bowls being turned on a lathe can be terribly frustrating as well as hard on the fingers.*

**TIP:** Wrap sandpaper or emery cloth around a sponge rubber ball before you start. The ball fits the inside curvature, enabling you to do a more uniform job of sanding than you can do with hand-held sandpaper.

***—Arthur Henrickson, Grand Rapids, Mich.***

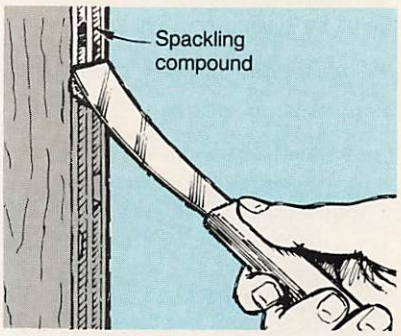


### SURPRISE FILLER FOR PLYWOOD EDGES

*How do you get the exposed edges of plywood smooth enough so they look like solid wood when painted? Using wood putty as a filler and sanding will do the job, but there's got to be an easier way.*

**TIP:** Use exterior spackling compound to fill plywood edges. It's easier to sand than wood putty, dries quickly, and is less expensive, too. Sand the spackling compound with 60- and then 120-grit garnet paper for a ready-to-paint surface.

***—Janet H. Sparks, Lexington, Ky.***




*Continued on page 26*

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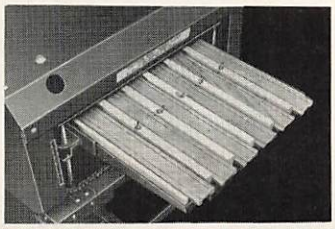
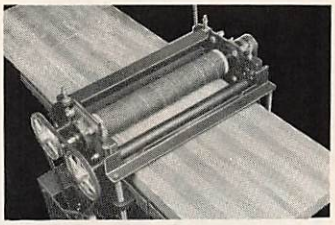


Woodmaster's Quick-Change Molding Head lets you create custom moldings from any stock. Choose from over 250 standard trim and picture frame patterns...or design your own!



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*R.V. Delacourt, Cleveland, Ohio*

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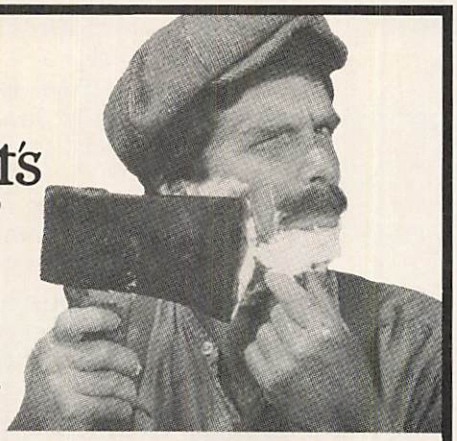

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## TIPS FROM YOUR SHOP (AND OURS)

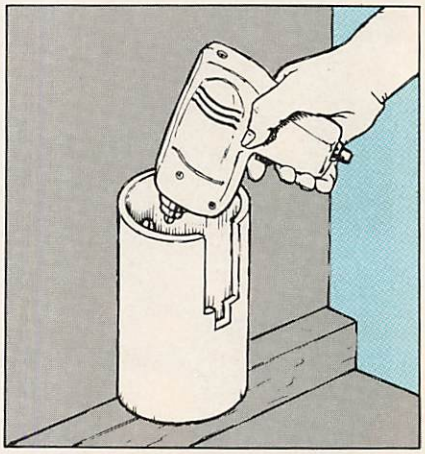
*Continued from page 24*

### POWER TOOL HOLSTERS

*In a confined workspace, everything ends up in a pile along the back edge of the workbench.*

**TIP:** Use thin-wall plastic pipe to custom-make holders for power tools and hand tools, too. Cut the pipe into 8″ lengths, and notch to fit various tools, including your electric drill and glue gun. Drill a hole in the back side and attach the holder to a wall with screws.

***—Steve E. Miller, Dallas, Ore.***

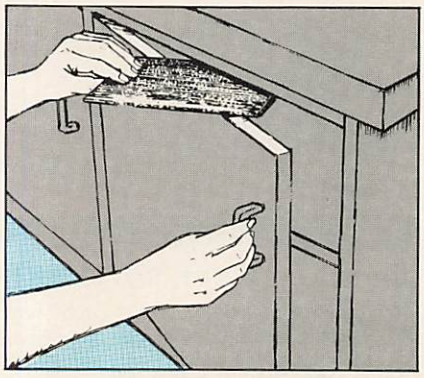


### AVOIDING A STICKY TAPE SITUATION

*It's not an open-and-shut case to fix a sticking door. Until you find the offending area, you don't know where to attack the problem.*

**TIP:** Place a sheet of carbon paper in the door with the carbon side facing the edge of the door. When you close the door, the paper will leave marks where the bind occurs. You may have to move the paper and close the door several times.

***—D. Roboway***
***Winnipeg, Man., Canada***



*Continued on page 29*

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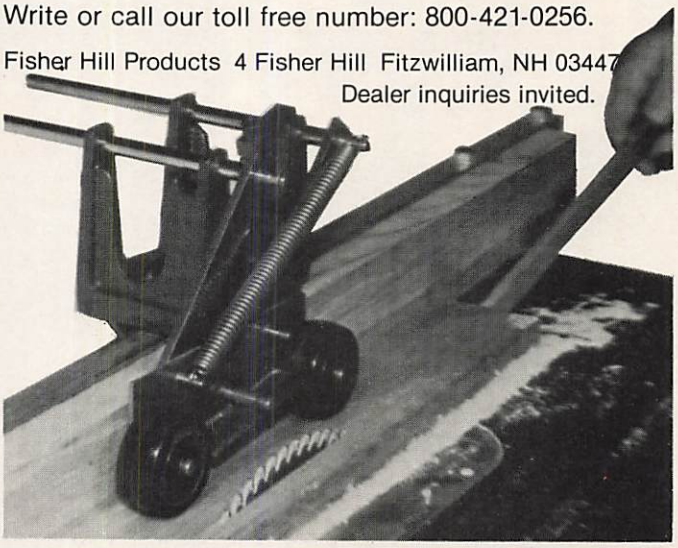

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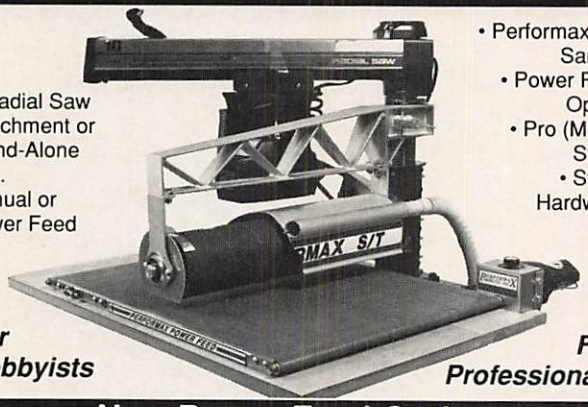


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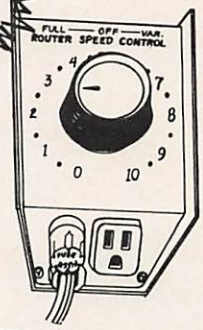


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## TIPS FROM YOUR SHOP (AND OURS)

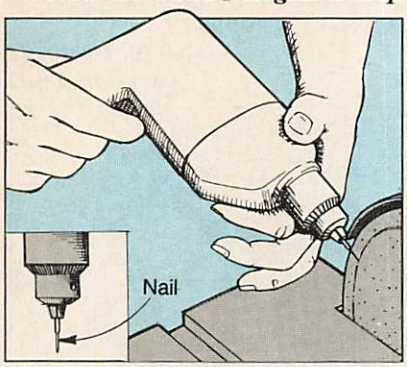
*Continued from page 26*

### FILLING THE NEED FOR A TINY BIT

*Every once in a while, you find yourself lacking the precise size of drill bit to do a particular job, especially in small diameters.*

**TIP:** Use a small finishing nail or brad in place of a standard bit. Snip or hacksaw off the head before putting it into the drill chuck. With the nail held securely in the chuck, grind the nail down by rotating it as you hold the side of the nail against a grinding stone, or sanding disc as shown *below*.

***—From the WOOD® magazine shop***

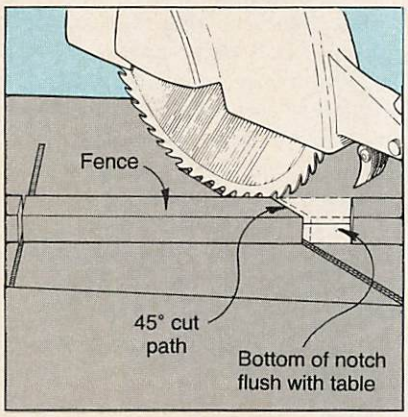



### ESCAPE ROUTE FOR CUTOFF PIECES

*A possible hazard when making miter cuts with a radial-arm saw occurs when cutoff pieces become trapped between the blade and the fence. The spinning blade can launch these scraps like bullets.*

**TIP:** Notch out about 1½" of the fence as shown. This prevents the cutoff scrap from binding between the blade and fence.

***—From the WOOD® magazine shop***




*Continued on page 30*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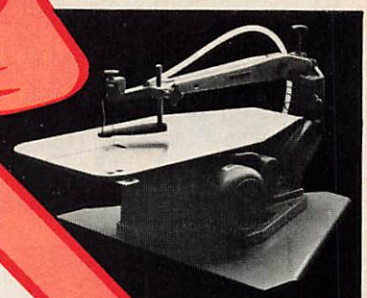


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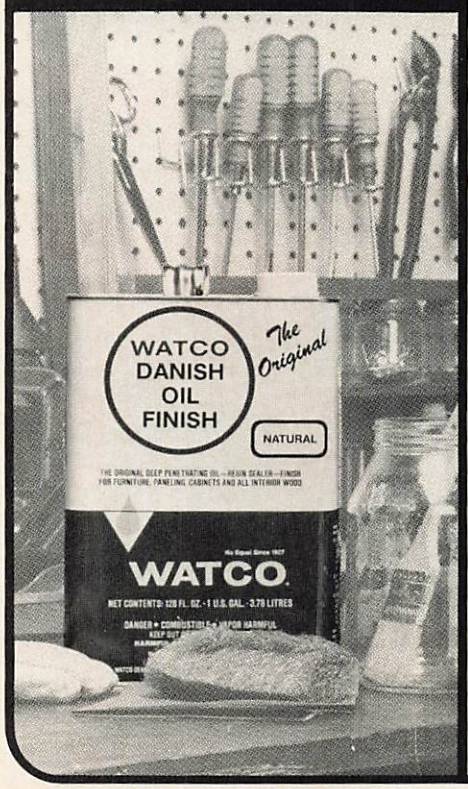


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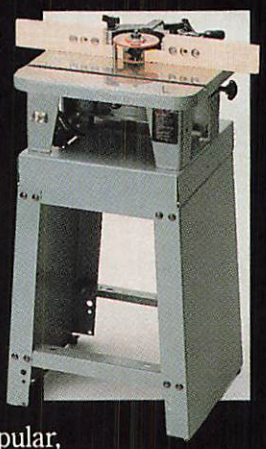

These shaper cutters aren't just another "freebie," either. Quite the opposite. They're valued at more than $100. And they're the most popular, commonly used configurations. Exactly what you need to start making all sorts of intricate, quality cuts in hard or soft woods.

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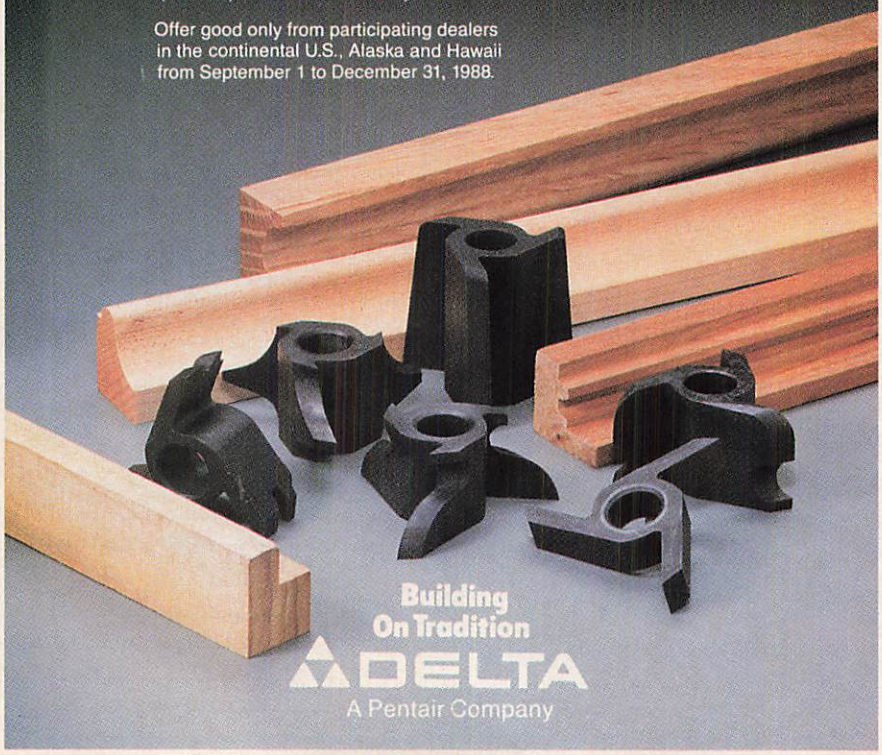
Offer good only from participating dealers in the continental U.S., Alaska and Hawaii from September 1 to December 31, 1988.



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## TIPS FROM YOUR SHOP (AND OURS)

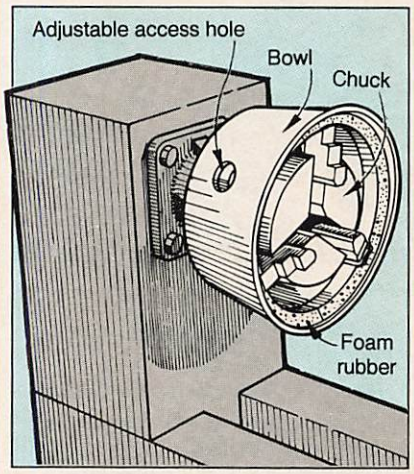
*Continued from page 29*

### MUZZLING A 3-JAW CHUCK BEFORE IT CAN BITE

*The jaw heels of some popular 3-jaw chucks protrude enough to pose a real hazard to the operator whose knuckles or tools venture too close to the whirling edges.*

**TIP:** Protect yourself with plastic tubs like the kind that hold margarine. Cut the bottom out of the tub and line the inside with foam-rubber weather stripping for a friction fit. With this installed, the shield will prevent you from getting whacked by the jaw heels, even if your knuckles get close enough for contact.

***—David M. Lipscomb, Knoxville, Tenn.***




### MORE HELPFUL TIPS

You'll find other useful shop tips scattered throughout this issue of *WOOD*® magazine:

- The secret to carving really hard wood, from an experienced pipecarver, page 41.
- An adhesive that's great for gluing small parts, page 44.
- How to use an auxiliary faceplate and hot-melt adhesive for multiple turnings, page 71.
- A way to make your own wooden clock hands, page 73.
- You can band-saw toy wheels and sand them to shape on a drill press, page 75.
- How to support a project when applying an aerosol finish, page 82.

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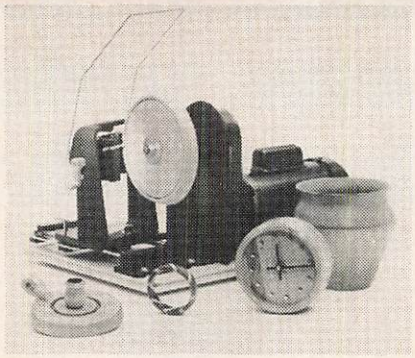

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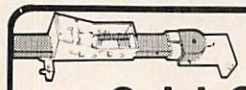

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# TOOL INDUSTRY INSIDER

Welcome to the first installment of *Tool Industry Insider*, where we bring you the inner workings of the tool industry—the story behind the tools, so to speak. If you'd like to see us investigate some part of the tool business, please write to us at:

**Tool Industry Insider**
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## CORDLESS SAWS: A DYING BREED?

Battery-powered portable circular saws made a big splash when they came on the tool scene several years ago. With sales of cordless drills and jigsaws already going along nicely, self-contained hand-held circular saws seemed to be the next logical step in the progression of portable tool battery technology.

**Have we seen the end of battery-powered circular saws? Not quite. New battery technology may energize this endangered species.**

But wait a minute. Sales of the tools soon slowed to a snail's pace; many users found the tools underpowered and limited in their applications. Recently, one of the three players in this area, Hitachi, dropped its cordless circular saw from the U.S. market.

Does this mean it's time to bury the idea of cordless circular saws? Maybe not. The other two makers, Milwaukee and Makita, plan to stay in the market. An official of Skil Corporation, a long-time innovator in portable circular saw technology, told us the firm plans to make a cordless version when improved battery technology makes it practical in terms of power and price.

Moreover, Black & Decker, a pioneer in cordless tool technology that opted to stay out of the battery-powered circular saw fray, may be getting involved in a big way. B&D will introduce, on a limited basis, a shoulder- or belt-carried battery pack that delivers 24 volts—double the voltage of current cordless tools. And, Black & Decker officials tell us a circular saw will be one of the tools that hook up to the 6.6-pound battery. Its one drawback: a $500 price tag. Have heart, though, the price of new tool technology seems to drop with time. Take for instance, Skil's first portable circular saw, introduced in 1924. The machine's price was a then-whopping $160.

## RYOBI BUYS MAKER OF SEARS POWER TOOLS

Ryobi Limited of Tokyo, Japan, recently bought Singer Corporation's Motor Products Division, supplier of hand-held power tools for Sears. The division has plants in Pickens and Anderson, S.C.

In a joint statement, the heads of Ryobi and Singer said: "... Ryobi is familiar with Sears' requirements and is deeply committed to further enhancing the Motor Products Division's reputation for product quality and innovation." Prior to the sale, Ryobi private-labeled a portable planer and a resaw band saw for Sears. Officials of Sears, headquartered in Chicago, had no comment on the sale.

Photograph: Bob Calmer

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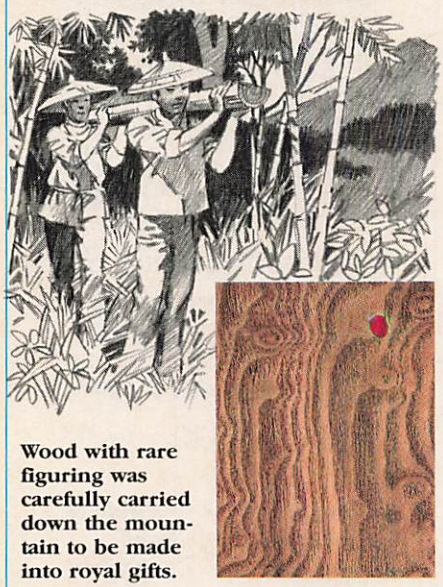
## WOOD ANECDOTE

# TAMO
## Tied-up treasure tree



Wood with rare figuring was carefully carried down the mountain to be made into royal gifts.

A species of common ash from the Far East produces one of the world's most rare and treasured woods. Native to Manchuria, but transplanted to the mountainous regions of Japan centuries ago, this particular ash owes its fame to a uniquely figured grain.

Tamo, also called *damo, shioji,* and *yachidama,* looks like white ash. Very few trees, however, produce figured wood that resembles peanut shells laid side by side. Tamo trees develop this peanut figure when strong vines encircle their trunks. This girdling restricts the flow of nutrients. So the tree grows in spurts, and the grain shows it.

When all timber harvesting was done by hand, workers would find such a tree, and in felling it, sometimes discover only half the wood to be figured. Because they had to carry the wood down the mountain on their shoulders, they only took the figured wood.

For centuries, the peanut-figured wood was reserved for items made for Japanese royalty and shoguns, due to the difficulty in obtaining it. Japanese master craftsmen, seeking a more reliable supply of figured tamo, eventually learned to tie ropes around saplings. The controlled constriction of the rope produced, over many years, the same figure in the tree. However, as these propagated tamo trees were harvested, the figured wood grew rarer and rarer.

Now, Japan relies heavily on the import of fine cabinetwoods. And peanut-figured tamo — tied, slow-grown, and cultivated — has become very rare. It's available only in Japan as extremely expensive, minutely-thin veneer used for the most exclusive projects.

Illustration: Jim Stevenson
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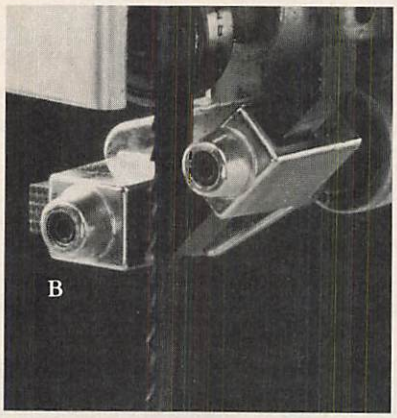


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You may have never seen a blade like this 24 tpi. In a raker style, these give smooth cuts while making incredibly tight turns. We strongly recommend our "Cool Blocks" for these delicate blades, because they can be set closer to the blade without danger of overheating or destroying the teeth as normal metal guides can.

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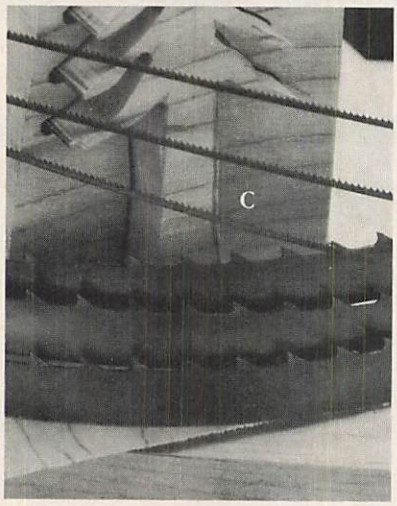
A Garrett Wade exclusive. In appearance, they look like "skip tooth" blades. But each tooth is actually formed as a hook, with every 5th tooth an un-set raker. The result is a very smooth cutting blade that feeds very easily. Use the ¼" (4 tpi) blade for general work, and the ½" size (3 tpi) for resawing and heavy straight sawing.

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|---|---|---|
| 93½" Blades (Delta 14" and copies) | | |
| 33K11.01 | 1/16" Scroll | $12.50 |
| 33K11.02 | ¼" Cabinet. | $11.65 |
| 33K11.03 | ½" Cabinet. | $11.95 |
| 80" Blades (Sears) | | |
| 33K12.01 | 1/16" Scroll | $11.95 |
| 33K12.02 | ¼" Cabinet. | $11.30 |
| 33K12.03 | ½" Cabinet. | $11.50 |
| 72" Blades (Shopsmith) | | |
| 33K13.01 | 1/16" Scroll | $11.25 |
| 33K13.02 | ¼" Cabinet. | $10.20 |
| 33K13.03 | ½" Cabinet. | $10.50 |
| 73½" Blades (Inca 10½") | | |
| 310.160 | 1/16" Scroll | $11.25 |
| 310.161 | ¼" Cabinet. | $10.20 |
| 310.162 | ½" Cabinet. | $10.50 |
| 104¼" Blades (Delta w/Riser and Inca 20") | | |
| 710.101 | 1/16" Scroll | $12.85 |
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**D / Saw Setting Gauge Can Be Read From Any Position**

Most saw setting gauges have at least one or two main weaknesses. They either rest partially on the insert plate which is usually not the same height as the main table, or they are so thin that it is difficult to ensure that teeth are being gauged at the top of the arc. This Gauge is made from machined Aluminum a full ¾" thick and 9" long. With ¼" graduations on one end and ⅛" on the other, it will indicate any height from ⅛" to 2". Most useful for Table Saws but also handy for Router depth setting. The markings are vertical on one face and horizontal on the other, so you can read them easily and accurately.

71K26.02 Saw Setting Gauge $16.95

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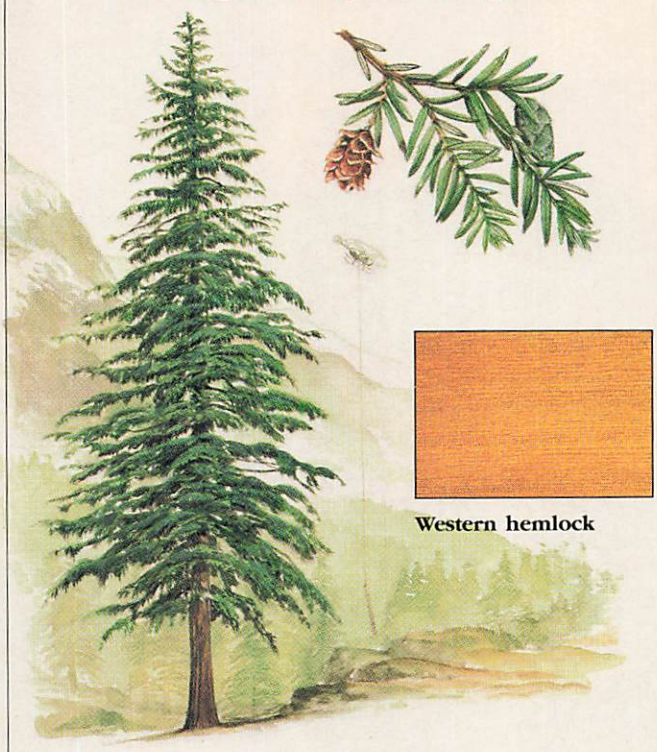
THE MAGAZINE FOR HOME WOODWORKERS
DECEMBER WOOD® 1988

# HEMLOCK

## The softwood that toughens up with age




In the last century, the bark of hemlock was sometimes worth more than the wood. The leather-tanning and fur-processing industries demanded hemlock bark for its high tannic acid content. Hides and skins infused with a tannic-acid solution become soft and strong. Tragically, stands of hemlock in the eastern United States and Canada were stripped of their bark, then left on the stump to die.

It wasn't until the '40s boom in wood-frame house construction that hemlock came into its own as lumber. And then, the eastern hemlock's West Coast cousin provided the raw material. Today, hemlock lumber from Oregon, Washington, and British Columbia (where the species represents 60 percent of the mature coastal forest) feeds home construction and millwork manufacturers. Hemlock even gives some hardwoods a run for their money as a lower cost, yet strong, easy-to-work furniture stock. In fact, this softwood actually grows harder with age!

### Wood identification

Botanist Stephen L. Endlicher christened hemlock in 1847 with the genus name *tsuga*. The Japanese word means "yew-leaved," referring to its short, flat, and contrary to legend, non-poisonous needles.

Eastern hemlock (*Tsuga canadensis*) plants its roots from Canada south to Georgia and west across the Great Lakes states to Minnesota. Western hemlock (*Tsuga heterophylla*), sometimes called Pacific hemlock, thrives in the moist coastal ranges from Alaska to northern California, but also climbs mountain slopes in Idaho and Montana.

Growing to greater size than its eastern relative—which only becomes 80′ tall and 36″ in diameter in 250 years—western hemlock represents one of the lumber industry's few remaining sources of large, clear timber. Trees 100 years old can be 150′ tall, with a 24″ diameter.

The bark of both hemlock species appears cinnamon-red to brown in color and has broad, deep ridges. Seed-bearing brown cones sprout at the ends of branch shoots.

Little color variance between hemlock's heartwood and sapwood results in a nearly uniform buff color in both species. The wood of western hemlock weighs more (about 29 pounds per cubic foot, dry) than that of its eastern relative. Western hemlock also is harder, stronger, straighter-grained, and resin-free.

### Working properties

You can work hemlock easily with hand or power tools. In crosscutting, however, expect some tearout.

The wood grips screws and accepts all glues without a problem. Western hemlock, with its straight grain and finer texture, sands to a silky, reflective smoothness. Because the western variety is resin-free, it accepts any paint, stain, or clear finish with more satisfying results than the eastern species. Don't use either hemlock species outdoors without preservative treatment.

### Uses in woodworking

The construction industry now frames, sheathes, and floors with hemlock. Mills turn the wood into windows, frame-and-panel doors, moldings, and paneling. Due to its strength and wear-resistance, hemlock also becomes reliable ladders and stair components.

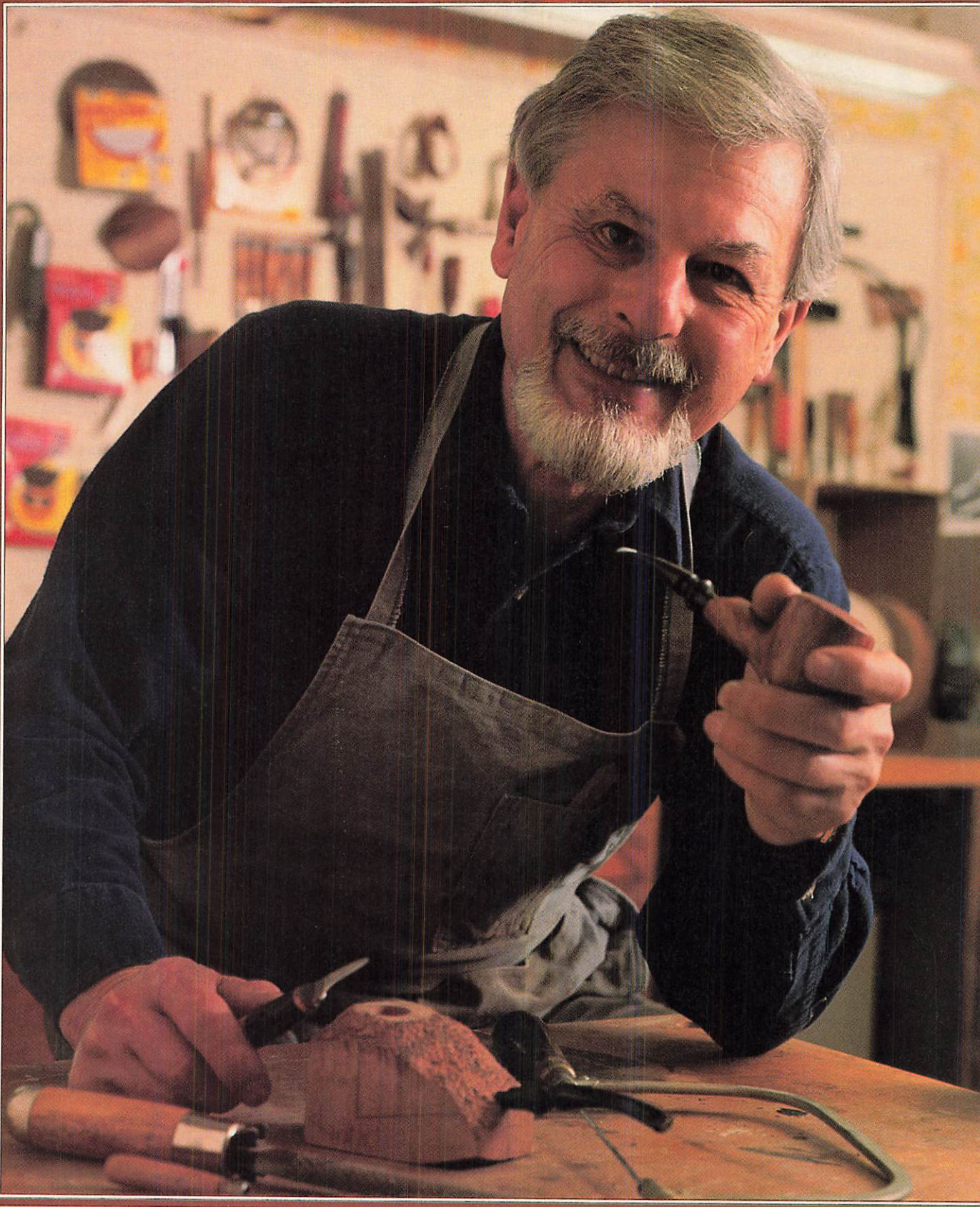
Ease of machining and finishing have made hemlock an increasingly popular alternative to hardwood for furniture and cabinets. Lack of pitch and resin also makes hemlock ideal for a sauna's dry heat.

### Cost and availability

Vast logging operations on the Pacific Northwest coast keep hemlock widely available in the West and Midwest. On the East Coast, even availability of local hemlock will be spotty.

If you need them, thick boards up to 14″ wide aren't rare. And, hemlock costs less than Ponderosa or white pine.

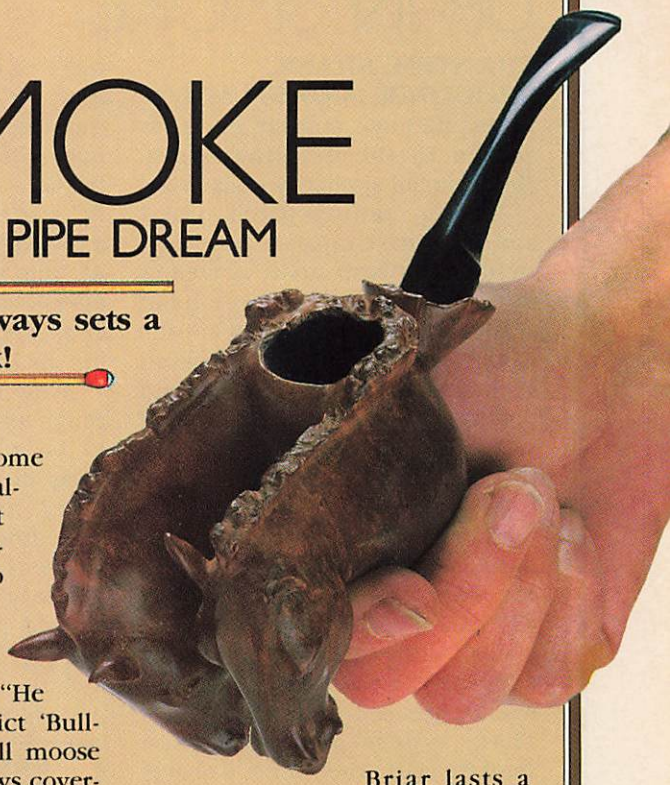
Illustration: Steve Schindler
Photograph: Jim Kascoutas



# UP IN SMOKE

## ONE WOODWORKER'S PIPE DREAM

**Vermont carver Al Baier always sets a match to his work!**



Carver Al Baier lives a pipe dream. He puffs choice tobacco through fine briar. He carves what he likes, when he likes. He meets people from faraway places. He's having more fun than a kid with a new bicycle. And, he's making money.

One of only a handful of pipe carvers in the United States, Al has whittled away thousands of dollars' worth of expensive, imported briar wood over the last 10 years. At selling prices ranging from $75 to $1,000, his pipes more than pay for the stock.

Ever since his win in a national pipe-carving competition a few years back, Al has become known for his carving talent, resulting in frequent special orders—sometimes unusual ones. Two years ago, for instance, he received an order for a moose-head pipe from a man in Chicago. "He wanted the pipe to depict 'Bullwinkle,' the Vermont bull moose that received national news coverage for falling in love with a cow. I had to find a stuffed moose I could copy!" he chuckles.

Former ad man Al Baier, *left*, loves to smoke Kentucky burley, his favorite tobacco, in a briar pipe. And for about the last decade, he has packed tobacco into nothing but his own hand-carved-models. Now retired from his Boston business, Al, 65, lives with Ginny, his wife, in Manchester Center, Vermont.

Within view of his pipe-carving workshop, a trout stream bubbles its way beneath a wooden footbridge. Al glances at it often as he crafts briar into pipes collectors clamor for. His active retirement has become Utopia, "I carve functional things I really appreciate in a setting I used to dream about."

◀ **"Make a pipe. You don't need many tools," says Al Baier.**

### MEDITERRANEAN WOOD GIVES YOU A SLOW BURN

"Briar makes the best pipes, but the best of pipes are made only from premium briar," says Al (see sidebar on briar, page 41). "It has tight fibers, beautiful grain, and gives a smooth, pleasing smoke."

A chunk of that briar about 1½" wide and 2" long (height varies due to burl irregularity) costs Al $7.50 buying wholesale from a major importer. Larger sizes cost more. And, Al counts on about a 25 percent loss due to hidden flaws in the burl.

"Root burl has a tendency to grow up and around dirt, sand, and small rocks," he says. "So, sometimes I'll be carving what looks to be a perfectly good piece of briar and hit a grain of sand. Surface pits can be filled with a little briar dust and epoxy. When I find a flaw that channels right toward the bowl, I have to throw it away."

Briar lasts a lifetime with moderate care, although it actually burns a little during each smoke. As the briar burns, carbon forms in the bowl, providing insulation. "You must scrape inside the bowl periodically to keep the carbon to the thickness of a dime," the veteran pipe smoker advises. "Too much carbon, it won't smoke right; too little, the bowl burns through."

### PROMOTING AMERICAN HAND-CARVED PIPES

"Ninety-five percent of all pipes are made in Europe, mostly by machine," says the pipe carver. "For awhile, Denmark was producing some handmade pipes, but I don't see them marketed." And that fact, Al believes, spells O-P-P-O-R-T-U-N-I-T-Y for any carver willing to take on briar.

"My marketing instinct tells me to get a group of American pipe carvers together," Al says. "The timing is right: The American dollar is down, so pipes coming from Europe cost more and more. The opportunity's here, there's a market, and, it's fun to do!"

*Continued*

# UP IN SMOKE

**THE STEM, SHANK, SHOULDER, AND STUMMEL**

Pipes all have similar parts, as shown in the drawing, *right*. However, all similarity ends there.

Among manufactured pipes, smokers distinguish between straight and bent stems as well as two dozen or more pipe-head shapes. Handcrafted pipes, on the other hand, have one-of-a-kind shapes. Among pipe smokers and collectors they're called *freehand* pipes. Imagination and skill are the only limits.

Sculptural, freehand pipes sell for a great deal more than standard, machine-made pipes. "On the average, I'm getting about $175 for one of my pipes," Al explains, "although I do have more expensive ones. Most machine-made pipes sell from $15 to $55. That's where most new pipe smokers start. Then, they discover the beauty of handmade pipes."

**THE CRITICAL CONFLUENCE**

The briar Al buys comes in misshapen chunks rather than blocks. So, he cuts them to rough rectangular shape on a band saw. "Grain direction really doesn't make any difference," Al advises, "since it swirls all around anyway."

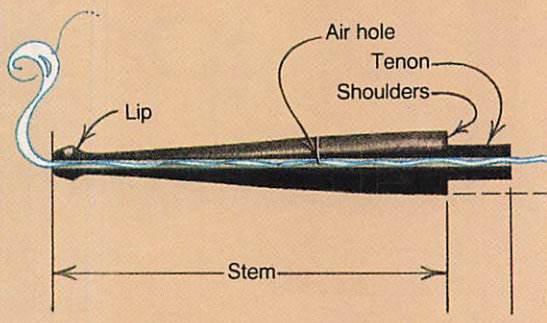
According to Al, boring the holes can be a ticklish operation, "The big thing is that the air hole has to emerge exactly at the bottom of the tobacco hole. If it's off, you get inferior combustion and an inferior smoke. Anyhow, I wasted many a block of briar."

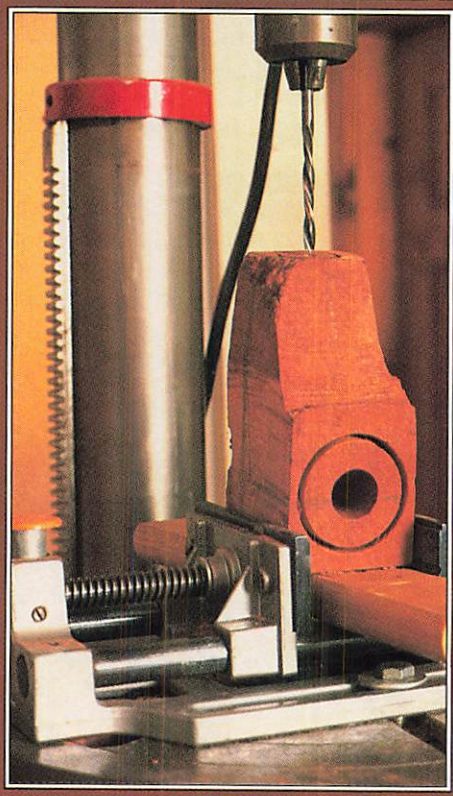
To mark the position of the tobacco hole, he draws bisecting lines on the top of the briar. On the side of the briar about 90° from the tobacco hole, he marks the location for the air hole. Al cautions: "The two holes don't have to be exactly 90° apart, but they must meet squarely."

At the drill press, Al bores the tobacco hole with a 7/8" spade bit. Depending on the size of the piece of briar, the hole will be either 1½" or 1¾" deep. To round out the bottom of the tobacco hole—"it makes for better combustion"—he switches to another 7/8" spade bit which he ground to a rounded shape. For the air hole, Al calls on a 5/32" bit. Finally, he bores a mortise for the stem tenon by centering a 5/16" bit squarely on the air hole.

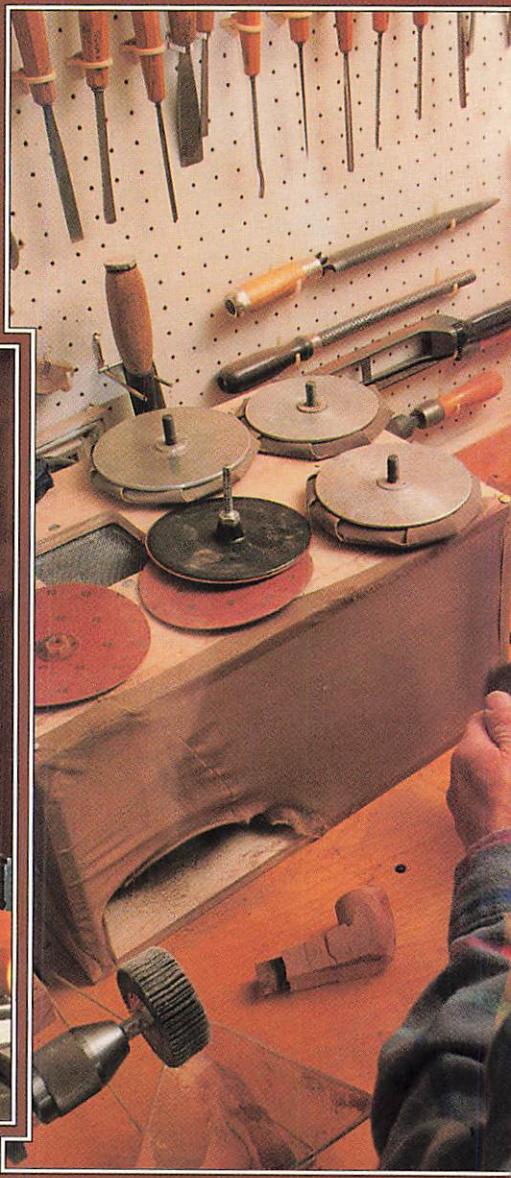
"Now, draw a pencil line to the rough shape you want your pipe to be and carve, chip, or hack away the briar with any tool you have," Al says. "When the wood gets down to the rough shape, you're ready for detailed carving.

There's a secret to that. Al learned it the hard way, with his first pipe he carved from a kit that included a stem and a predrilled briar block.

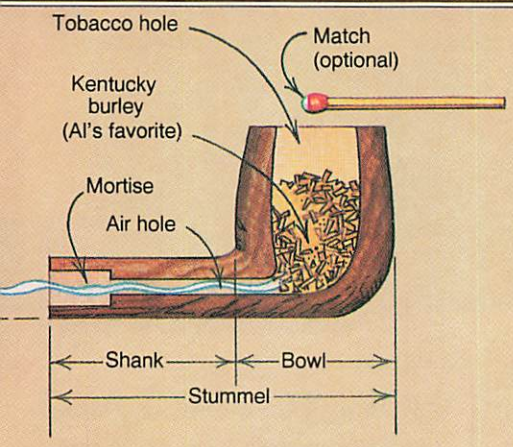


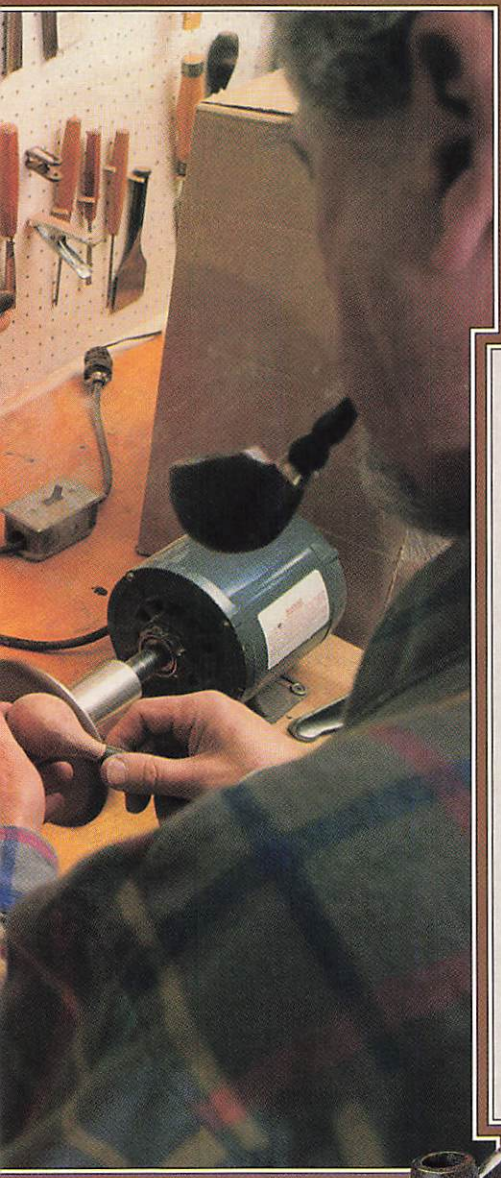



▲ How and where the air hole meets the tobacco hole spells the difference between a good pipe and a bad one. Al made a special fixture to clamp the briar in exact position on the drill-press table for boring.



▲ Sanding discs, a flap sander, and even rasps come into play when Al shapes the imported rock-hard briar block for one of his pipes.



**PASS THE VINEGAR, PLEASE**

"I was using all my conventional carving tools—even a mallet and chisel—to try and carve the briar down," he recalls, bouncing a marblelike briar block on the table. Clunk. "In my haste to carve I had completely overlooked one tip in the instructions."

"That was, after you have done your rough carving, dunk that pipe in vinegar (white, 5% acid vinegar works best) and let it soak at least overnight! Then, carve it wet, right from the vinegar, and don't let it dry out until after the carving is done."

In shaping the pipe, Al always maintains a ⅜" wall thickness to keep the pipe from burning through in less than a lifetime. He notes, "To guide me, I bore a shallow circular mortise ⅜" around the outside of the bowl with a circle cutter. The thickness of the shank doesn't matter, except that it has to be sturdy."

For much of the finish carving, Al depends on assorted riffler files. Sanding begins with 100-grit rather than 80-grit paper to avoid deeply scratching the bowl. Prior to the final sanding, he colors the briar with an alcohol-based aniline dye. "Some people prefer a natural finish, though," he notes, "because in use, the pipe grows darker with oil from the hands."

For a high luster on his pipes, Al finish-sands with 180-grit, then 220-grit paper, followd by 320-grit paper dry, then 400-grit wet. At the buffing wheel, he dabs on some tripoli, an abrasive compound, and polishes the pipe until he's satisfied.

## PIPE LORE: THE LEGEND OF BRIAR

"In 1857," says Al, nesting into his easy chair, ever-present pipe in hand, "a French nobleman was traveling through the southernmost part of his country's Jura Mountains. In a small village called Saint-Claude, he settled down for a meal and the enjoyment of his favorite Turkish meerschaum pipe. But, he broke the brittle bowl!

"As it turned out," Al continues, "a local woodcarver happened to have a chunk of aged root burl from the white heath tree [*Erica arborea*], a woody shrub that grows in harsh, rocky soil. It took the carver all night to carve a pipe from the rocklike wood. After trying the new pipe," Al puffs for emphasis, "the elegant Frenchman thought it far superior to his old meerschaum. From that day on, briar's fame spread—first throughout France, then all of Europe.

"Today, 90 percent of all pipes are made of briar. And, the village of Saint-Claude calls itself the world's briar-pipe capital."

Briar destined for the world's finest pipes still comes from the mountain country around the Mediterranean Sea in France, Italy, Greece, Spain, and the islands of Corsica and Sicily. In these countries, diggers unearth the root burls and deliver them to the mills. There, saws cut the largest part of the burls into blocks called *ébauchons*. Blocks sawn from the upper and outer layer of the burl—distinguished by a pebble-textured "skin"—are named *plateaux*, and command top dollar.

▶ **Al's freehand pipes feature handles called "bridges," scrimshaw inserts, and shapes to suit his fancy.**

Written by Peter J. Stephano  Photographs: Jim Kascoutas  Illustrations: Jim Stevenson

# INL

Thousands of years ago, artisans inlaid tombs of Egyptian Pharoahs with precious metals and jewels. In the centuries since then, skilled craftsmen have refined the process of inlaying veneers into their finest woodwork. Now, with the help of power tools, modern adhesives, and high-quality veneers, you can achieve similar results in your own workshop. Take, for example, the serving tray project on page 48. We think its floral inlay makes a big difference in the overall quality of the piece.

Though most woodworkers have never tried inlaying, we found it to be a fairly straightforward technique that's well within most everyone's capabilities. We'll show you how to make and install your own inlay designs, and give you some tips for working with premade inlays and bandings, as well. (See the Buying Guide on page 47 for our source of these products.)

You probably already have several of the tools required to do inlay projects. You'll need an X-acto knife for cutting veneer pieces of the inlay; a router to create an inlay recess; small hand-router plane for cleaning up the recess; gap-filling cyanoacrylate (instant) glue that enables you to join the segments that make up the inlay; and two-faced cellophane tape for holding the segments in place. (See the Buying Guide on page 47 for our source of instant glue.)

One important note before you choose your materials: We recommend that you set both inlays and bandings into plywood or another stable material. If you use a solid wood as a base for an inlay, you run the risk of waking up some morning and finding that your inlay has buckled or cracked.

### INTARSIA—WHAT DOES IT MEAN?

Together, inlay, marquetry, and parquetry make up a form of wood decoration called *intarsia*. Often used interchangeably to describe similar techniques, it's no wonder these terms have a lot of us confused.

*Inlay* entails cutting a recessed shape into a wood surface and laying an image made of thin pieces of wood *into* the resulting recess. With *marquetry*, you create an image from thin pieces of wood and adhere that image *onto* a wood surface.

On the other hand, you lay *parquetry into* or *onto* a surface. It differs from inlay in that you always deal with straight lines and/or geometric shapes.

## HOW TO MAKE AND

Once you master a few basic techniques, customizing a project with an inlay pattern of your own design can be rewarding and fun, allowing you to create with wood veneers almost anything you can imagine. Keep in mind, though, that the time and skill level necessary to complete an inlay project increases with the number and intricacy of parts in the design. You may want to start with a simple design, such as the balloon we use as our example in this article, or with one of the three other free patterns we offer on page 46.

### PREPARING THE PATTERN

If you're making your own design, draw the pattern with dark ink on white bond paper, so the pen marks show through the paper from its back side. With your full-sized pattern in hand, number each segment of the pattern to organize your work. Now, select the grain direction for each segment by considering the way color would flow in that object in its natural state. Then, draw two lines on each pattern segment showing the best grain direction. If the pattern has more than a dozen segments, you may want to note the wood species on each segment.

Since you'll need two copies of this pattern, one for cutting out segments of the inlay from veneer, and the other for assembly of the inlay, you can now make a second copy of the pattern. Next, lay butted strips of double-faced cellophane tape over the image area

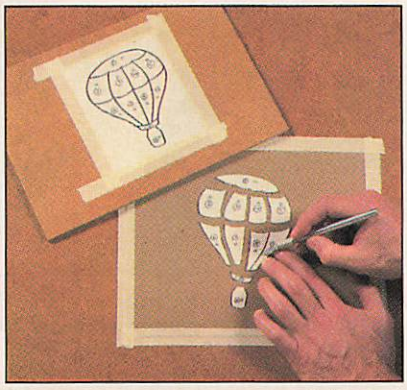
# AY

**Recently, we took a fresh look at this time-honored woodworking technique in our shop and came away with some nifty new ways of doing things. To get you started, we'll go through the basic process, and even give you several free patterns, including the flying geese and balloon inlays shown here. In no time, you'll be ready to take flight with designs of your own making.**

## INSTALL YOUR OWN PATTERNS

of each copy. Designate either one of the patterns as the assembly copy, and attach it to a hard, smooth work surface (such as hardboard) with masking tape.

Lay a sheet of waxed paper over the entire taped area of the other pattern. With an X-acto knife, cut around the perimeter of the design, then cut apart each of the segments as shown *below*. Take your time; inlays turn out best when you exercise patience.



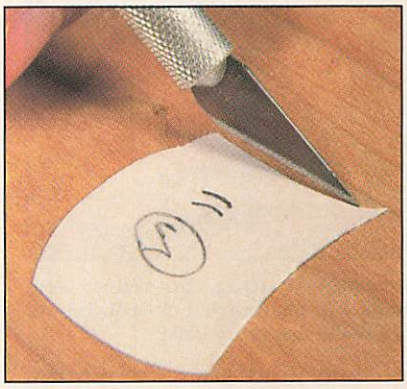
**Cut apart all the segments of the cutting copy with an X-acto knife before attaching them to veneer. We put the veneer pieces together on the assembly copy, *top*.**

### CUTTING THE VENEER PIECES

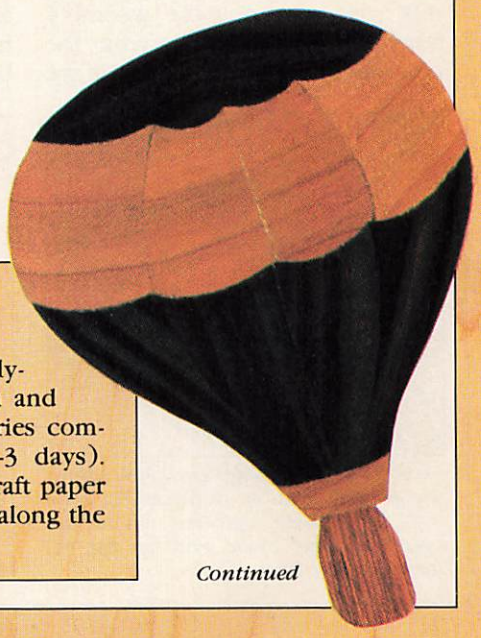
Unless you have some veneer left over from a previous project, you'll need to order some. The sources on page 47 carry a full selection of species, plus dyed veneers in a rainbow of colors. Stay away from the 1/64"-thick flexible veneer, though; it's too thin for inlay. Most veneers will arrive flat enough to work with; however, burl and crotch pieces will almost always be wavy. To flatten veneer, use the procedure described in the box *below*.

With the veneer ready, peel the waxed paper from one segment, and look for a section of the veneer with interesting grain pattern. Then turn the veneer for best grain direction and lay the segment sticky-side down on the veneer. You should be able to see the segment number and grain marks (they'll be reversed) through the paper.

Carefully cut around the edges of the segment with a sharp X-acto knife as shown at *right*, making several passes if necessary. Cut the end grain first to minimize splintering. Do not rush through this stage—your accuracy here determines how well the inlay will fit together.



**Pull the X-acto knife away from the corners of a segment to prevent the veneer from splintering.**



### HOW TO TAKE THE WAVE OUT OF WAVY VENEER

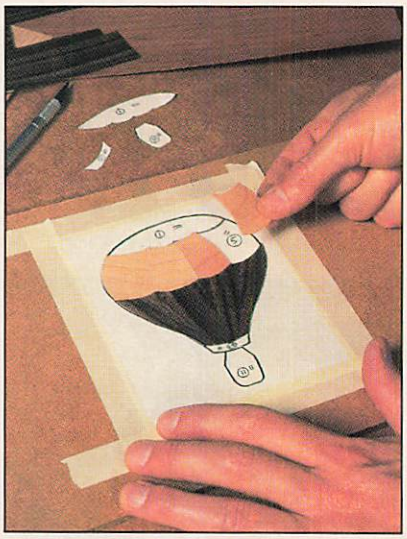
To flatten veneer, start by mixing a solution of 2 ounces of pure glycerin (available from drugstores) in one quart of water. Lightly sponge or mist the solution onto one side of the veneer—do not soak it. Immediately place the veneer between sheets of kraft paper (from brown grocery bags), and place this assembly between two pieces of plywood. Clamp this sandwich and let it sit until the veneer dries completely (normally about 2–3 days). You'll have to change the kraft paper at least once a day to speed along the drying process.

*Continued*

# INLAY

## ASSEMBLE THE INLAY

As you cut the veneer pieces, place them paper-side down on the assembly copy, and butt them tightly together as shown *below*.



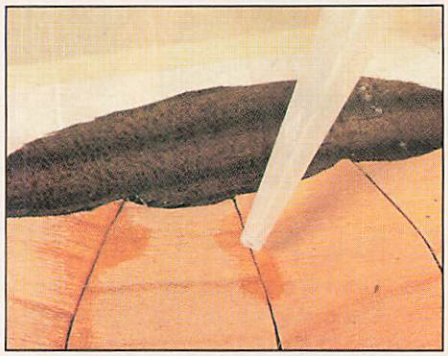
**Accurately cutting the veneer segments will guarantee a close-fitting inlay on the assembly copy.**

You may find after assembling much of the inlay that the shape of some segments will need modification to fit the already-assembled veneer pieces around it. In this case, cut out the assembly copy segment by following the contour of the inlay pieces, as we did in the photo *below left,* rather than the pattern lines. Then, apply that segment to the veneer so you can cut a perfect-fitting piece. When you return the piece to the assembly copy it will not stick, of course, but this won't be a problem as long as you keep this practice to a minimum.

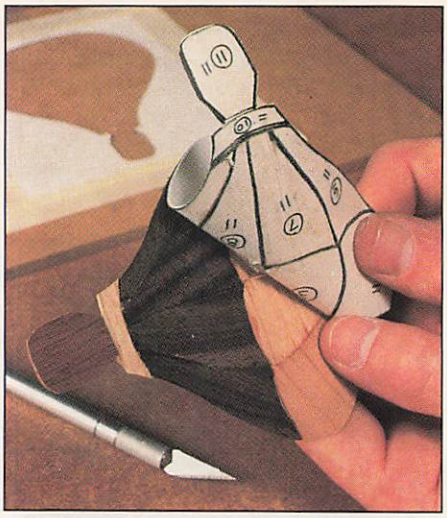
With all the veneer pieces in place on the assembly copy, tack them together with gap-filling instant glue at the points where they tightly butt together as shown at *right*. Filling the crevices between pieces will detract from the final look of the inlay, so avoid this if possible. Do not spray the instant glue with "accelerator" to speed drying—the glue may bubble and turn white.

After the glue completely dries (2–3 minutes), run an X-acto knife along the outside edge of the inlay to cut it away from the assembly copy. If any veneer pieces form a ragged outside border where they join, cut the veneer away as necessary to make a smooth edge all around the inlay.

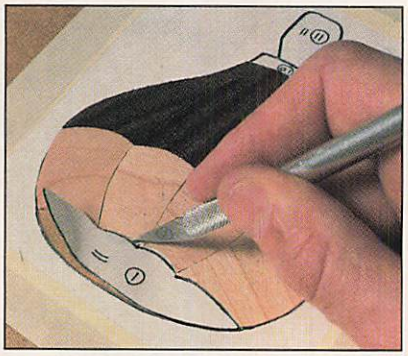
Now, gently peel away the pattern from its back side as shown at *right*. At this point you should have an assembled inlay ready to be set into a recess.



**Gap-filling instant glue holds the inlay pieces together.**

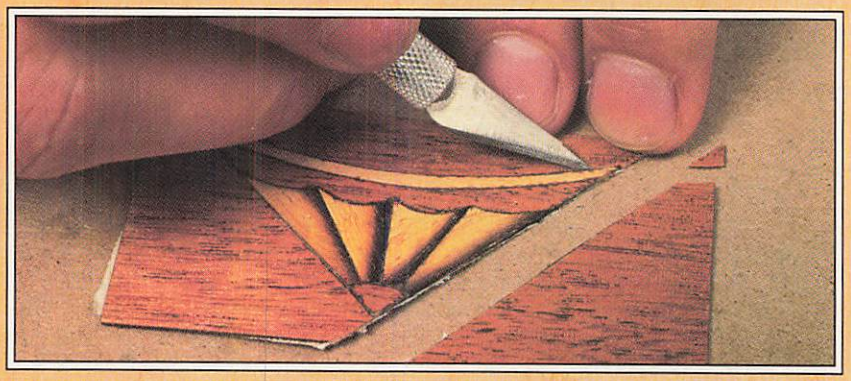


**Carefully peel away the pattern materials from the inlay. If the pattern sticks, gently lift it away with an X-acto knife.**

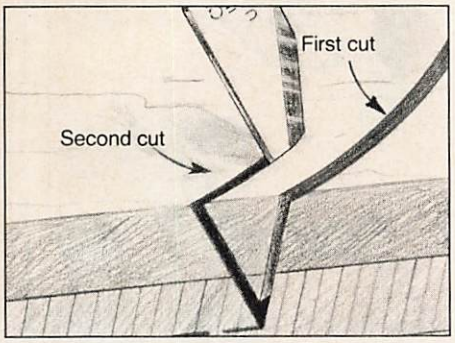


**Save for last the segments that adjoin the greatest number of pieces. To get a tight fit for these segments, cut out the assembly copy piece, and cut the veneer directly from it.**

## HOW TO WORK WITH PREMADE INLAYS



**Be careful not to cut the plywood surface outside the edge of the inlay when you make the first cut—you can't disguise those cuts later.**




**Make the first cut straight down into the plywood. Hold the knife at a 45° angle for the second cut.**

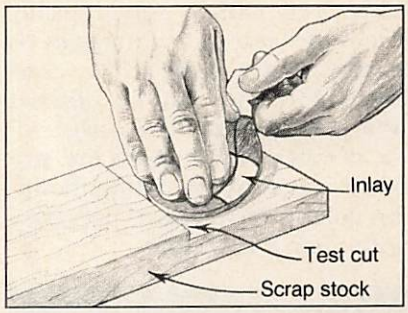
## CUTTING A RECESS FOR YOUR INLAY

To create a recess, first apply small strips of double-faced tape along the edge of its back side, with only ⅛″ of the tape extending into the inlay. Now, position the inlay tape-side down on the plywood surface. Then, cut straight down with an X-acto knife to a depth that's at least the thickness of the inlay as shown *above left*.

After cutting all around the inlay, gently lift it from the surface and peel away the tape. With an X-acto knife, make a second cut at a 45° angle on the inside of the first cut (see illustration *below left*). The second cut defines the border of the recess, and makes for easier routing of the recess.

Next, remove the material within these cuts. Start by finding a straight router bit of a diameter that allows routing into the narrow sections of the pattern. For our example, we used a ¼″ bit.

Set the bit for the approximate thickness of the inlay, then make a test cut on scrap stock. Check the inlay against the test cut, and adjust the router until the depth of cut allows the inlay to stick just slightly above the surface (see illustration *above right*). With the depth set, clamp the plywood stock, lower the turning bit into the recess area, carefully rout along the edges first as shown *below*, and then rout away the material in the center.




**Test the depth of the router's cut in scrap stock before making the recess.**

**Rout along the outline of the recess first, and then remove the center.**

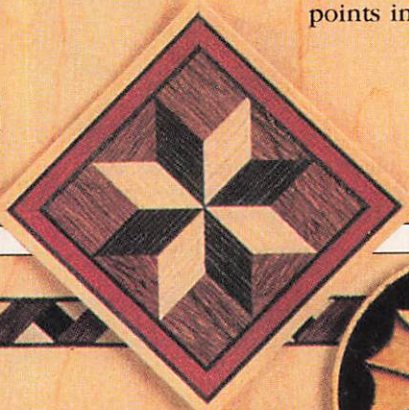
You will not be able to remove all the necessary material with a router. But you can clean up leftover material with a chisel, or

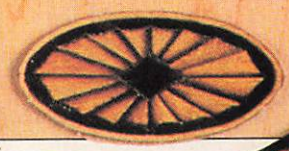
*Continued*

If you don't have the time to make your own inlays, you can buy premade inlays such as those shown at *right* from the sources on page 47. You can inlay these in much the same way we've described, but keep these differences in mind:

◀ **Avoid the temptation to bend and crack away the extra material around premade inlays. An X-acto knife will help you cut away the excess while keeping the inlay intact.**

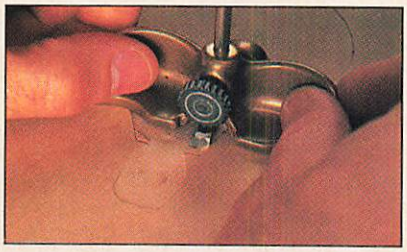
- Many premade inlays have excess wood surrounding the pattern, so cut it away with an X-acto knife. When making these cuts, pull away from fine points in the inlay as shown at *left*. Then, follow the steps *above* for cutting the inlay's recess.
- You also glue and clamp the inlay as described on page 46, but make sure you place the inlay in the recess with its paper backing facing up.





# INLAY

better yet, with a router plane. The router plane shown *below*, or Stanley router plane #271, costs about $16 and can be ordered from Constantine's (see page 47 for details). Now, check the size of the recess by dry-fitting the inlay; enlarge the recess as necessary with your X-acto knife.



**Use a router plane to remove excess material from spots too tight for a motorized router.**

## CLAMPING AND PATCHING: THE FINISHING TOUCHES

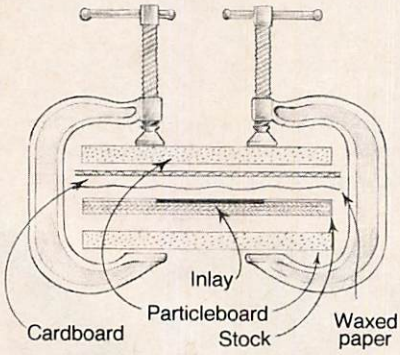
After completing the recess, assemble the materials necessary to fasten the inlay into the recess. You'll need woodworker's glue, two pieces of particleboard (each large enough to cover the inlay completely), cardboard, waxed paper, and at least four C-clamps or handscrew clamps.

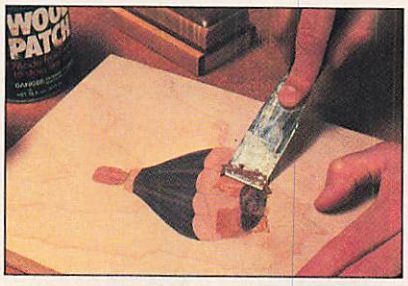
Apply a thin layer of woodworker's glue to the back side of the inlay and onto the surface of the recess. We used a toothpick to work glue into narrow spots. Now, place the inlay in the recess and clamp it as illustrated *below left*. The cardboard layer allows the clamping pressure to conform to the irregular surface of the inlay. Position the clamps for even pressure and tighten securely.

Remove the inlayed piece after 30 minutes of clamping—enough time for the glue to skin over. The glue will be sufficiently soft that you can use an X-acto knife to scrape away the excess glue that has squeezed between the crevices of the inlay. If left in those crevices, the glue will appear white when dry; removing it promptly allows you to later color the crevice with wood putty.

Now, reclamp the inlay, using a fresh piece of waxed paper. Let it sit at least six hours.

Remove your project, and lightly sand the inlay flush with the plywood surface with 100-grit sandpaper. To ensure a flush surface, use a sanding block at least twice as long as the inlay. Be careful not to sand through the inlay. To fill the crevices, you'll need a putty knife and several colors of wood putty. Fill crevices along the outside of the inlay with a putty that matches the surrounding plywood. For crevices on the inside of the inlay, use a color matching the darkest adjacent segment. Apply the putty as shown *below*. Allow it to dry, then sand the inlay with 150-grit sandpaper.

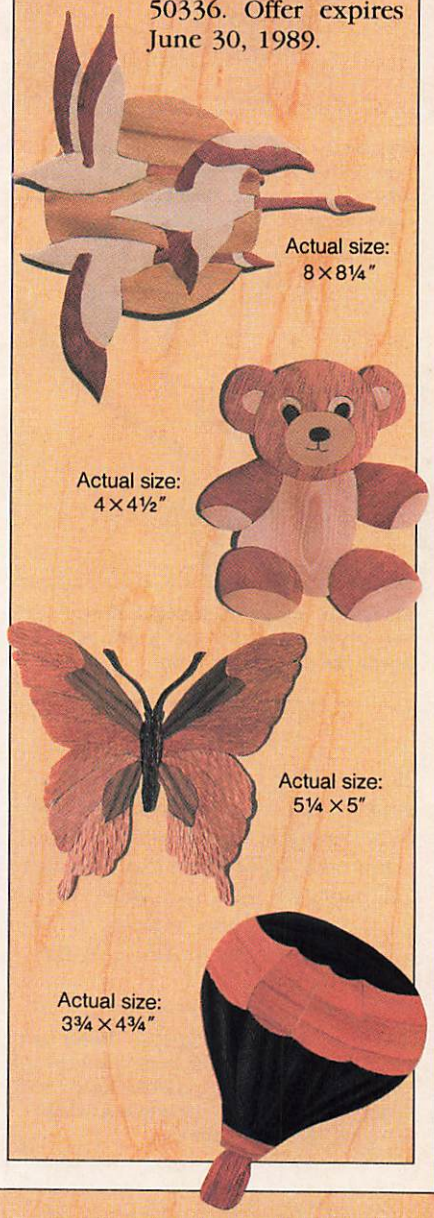


**To blend in the inevitable crevices, firmly press wood putties matching the surrounding wood into each one.**

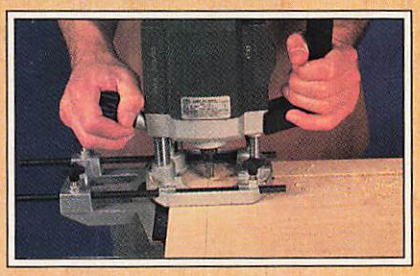
**FREE PATTERN OFFER**

To get you started with inlay, we'd like to send you four free full-sized inlay patterns. In addition to the balloon constructed here, we've gathered three other patterns shown *below*. Just send a self-addressed, stamped, No. 10 business envelope to: Inlay Patterns, WOOD® Magazine, Locust at 17th, Des Moines, IA 50336. Offer expires June 30, 1989.

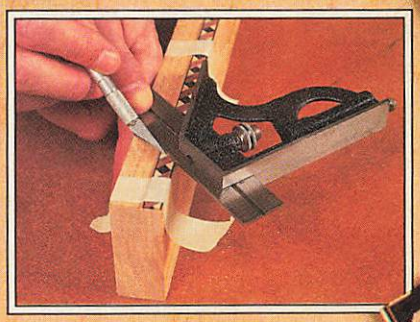


# GET AN EDGE ON YOUR PROJECT WITH BANDINGS

After a little practice, we think you'll find installing bandings easy and fun. You can buy many different bandings (see a few at *right*), in lengths of 36", and in widths from 1/16" to 1 1/8". For this technique you'll need a router, sharp chisel, combination square, X-acto knife, and woodworker's glue.



**A plunge router equipped with an edge guide simplifies cutting the recess, but fixed base routers and fences will work just as well.**



**To miter the banding, align it and a combination square with the edge of a piece of scrap stock, and follow the square's blade with an X-acto knife.**

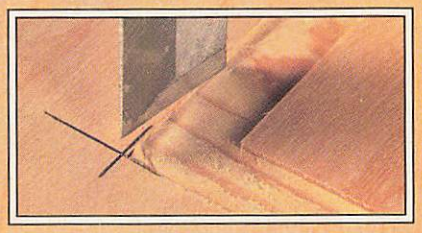
## MAKING A RECESS FOR THE BANDING

Like inlays, bandings sit in a recess slightly less deep than the thickness of the banding. To make the recess, first select a straight router bit the same width as your banding. If you don't have one the exact size, choose your next smallest. For example, for a banding just slightly over 3/8" wide, make a 3/8"-wide recess and then enlarge it about 1/16" by making a second pass with the same bit. Before cutting into your work piece, make a test recess on scrap stock.

Next, lay out the position of the banding on your stock with faint pencil lines. Draw the outside edge of the banding all the way around your stock, allowing the lines to overlap in the corners.

Using either the router's edge guide or a fence clamped to your stock, line up the router bit to follow your layout line. With the edge guide or fence set, start the router's left-to-right cut in any corner as shown *top right*. If you own a plunge router, plunge the bit down, rout to the next corner, then let the bit spring back up. For fixed-base routers, make sure you tilt the bit into the stock in a motion parallel to the layout line.

After completing the routing, you'll have to square the rounded outside corners of the recess. Start by aligning a chisel (it should be at least twice as wide as the banding you're using to assure a cut that's parallel to the recess) in a straight line with the outside edge of the recess as shown *above*. With the chisel's edge to the corner (and not beyond), strike it with a mallet to the depth of the recess. Repeat for the other side of the corner and lift out the excess material with the chisel.



**Use a chisel, with its bevel facing the recess, to remove excess corner material in a line parallel to the recess.**

## CUTTING AND INLAYING THE BANDING

For a pleasing effect, miter the banding so its pattern aligns as much as possible in the corners. First, measure the outside dimension of the recess, then use a combination square, scrap stock, masking tape, and X-acto knife as shown *above* to miter the banding to length.

Before gluing any banding in place, you should first cut and dry-fit each piece, one at a time. Start on any side and work all the way around the border.

Once you're satisfied that the bandings fit well, you can gently pry them out with an X-acto knife. Lay them on the stock near their respective recesses so you don't get them mixed up, and apply a layer of woodworker's glue to the bottom of the recess. Now, reinsert the bandings and proceed with clamping and finishing as we did with inlays under the section "Clamping and Patching: The Finishing Touches" on page 46.

### BUYING GUIDE

- **Veneers, premade inlays, and bandings.** Constantine's, 2050 Eastchester Rd., Bronx, NY 10461; and The Woodworker's Store, 21801 Industrial Blvd., Rogers, MN 55374.
- **Gap-filling cyanoacrylate (instant) adhesive.** Trade name "Hot Stuff-Super T," 2 oz.; and solvent, 3 oz. $16.95 ppd. Craft Supplies USA, 1287 E. 1120 S., Provo, UT 84601.

Written by Bill Krier with Jim Boelling and James R. Downing
Photographs: Jim Kascoutas Illustrations: Douglas Nicolet

# AT YOUR SERVICE
# INLAY SERVING TRAY

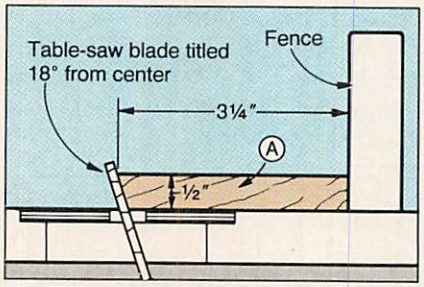
**Put on a fresh pot of coffee! You'll be proud to serve guests with this stunning oak tray. We asked Judy Gale Roberts, featured on our October 1988 cover, to design an exclusive floral inlay. Now, we invite you to try our splayed sides and ends with the help of step-by-step drawings.**

*Note: For more information pertaining to inlay, refer to this issue's shop-tested techniques article starting on page 42.*

*You'll need some ½" oak stock for this project. You can either resaw or plane stock to the correct thickness.*

**START WITH THE TRAY ENDS**

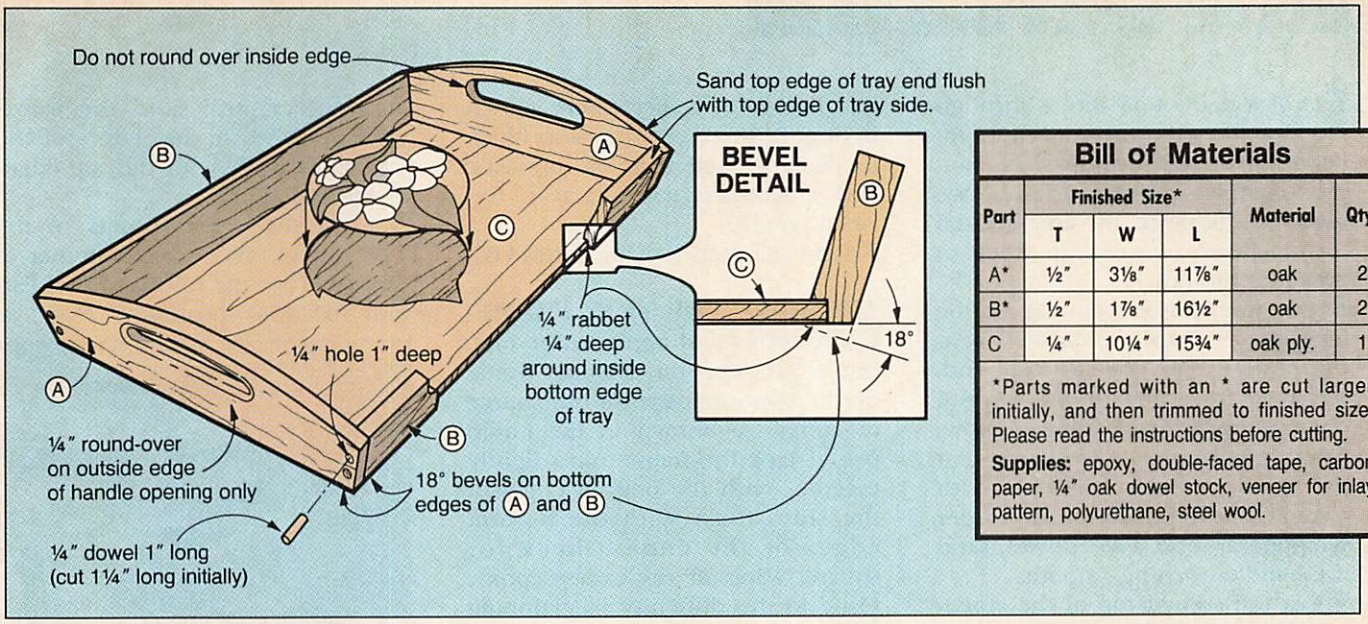
**1** Cut two pieces of ½"-thick oak to 3¼" wide by 11⅞" long for the tray ends (A). (We planed ¾"-thick oak to ½" thick.) Using the setup shown *below left,* bevel-rip the bottom edge of each tray end at 18°.




**2** With the edges and ends flush, and the bevels facing out, stick the two end pieces together face to face with double-faced tape. (For reference, see the Bevel Detail accompanying Step 1 of the drawing titled "Miter-Cut the Tray Ends.")

**3** Using carbon paper, transfer the full-sized half-pattern handle outline, opening, and center points for the ¾" handle-hole opening shown at *right* to a sheet of white paper. (We've found that heavy paper or thin carboard works best for templates.) Or, photocopy the pattern. Now, cut the half-pattern template to shape (don't cut the handle opening, though).

**4** Using the template, carefully trace the half-pattern outline onto

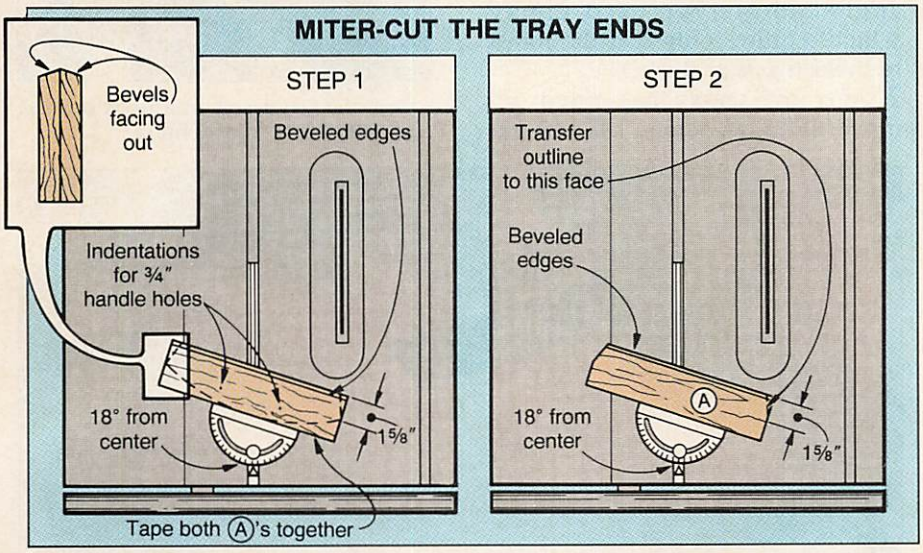



## Bill of Materials

| Part | Finished Size* | | | Material | Qty. |
|---|---|---|---|---|---|
| | T | W | L | | |
| A* | ½" | 3⅛" | 11⅞" | oak | 2 |
| B* | ½" | 1⅞" | 16½" | oak | 2 |
| C | ¼" | 10¼" | 15¾" | oak ply. | 1 |

*Parts marked with an * are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

**Supplies:** epoxy, double-faced tape, carbon paper, ¼" oak dowel stock, veneer for inlay pattern, polyurethane, steel wool.

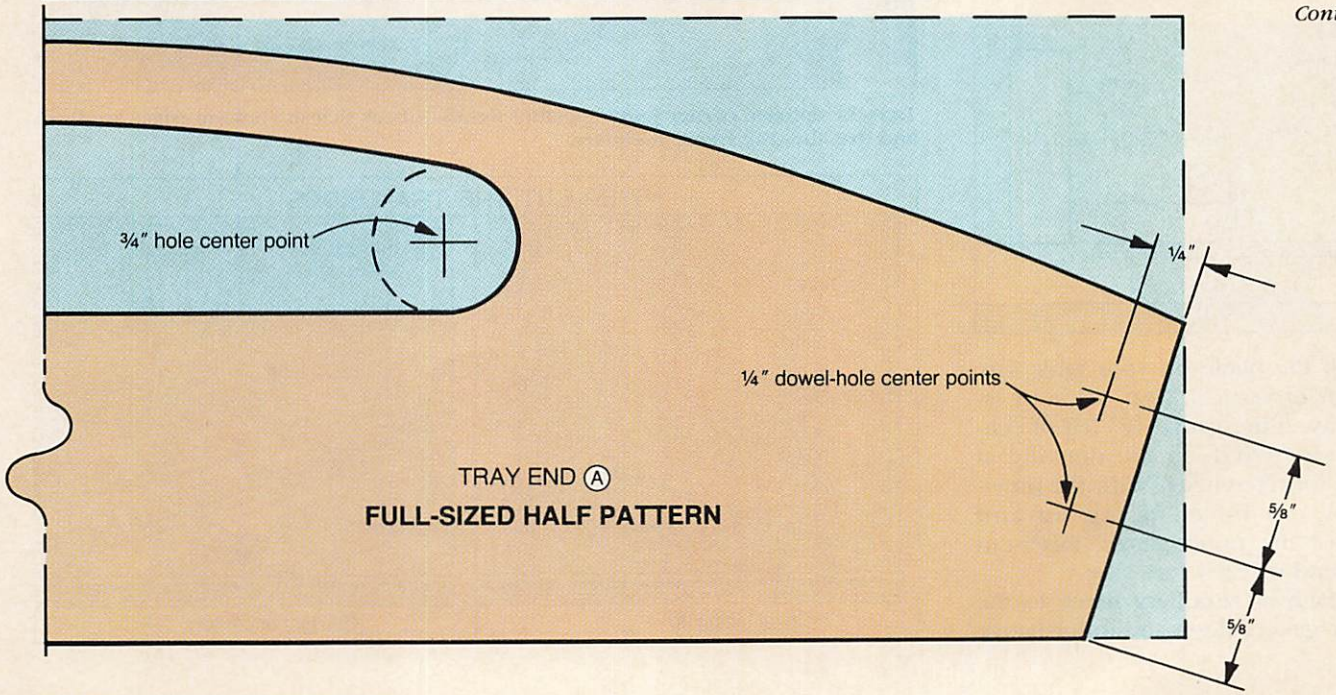



the taped-together tray ends. You'll have to use the template twice to mark both halves of the outline onto the top tray end. Using an awl, poke through the template to transfer the ¾" handle-hole center points to the top tray end. Set the template aside for now.

**5** Set your miter gauge 18° from center, and trim one end of the taped-together tray end pieces where shown in Step 1 on the drawing at *left*.

**6** Using a square, transfer the remaining cutline to the opposite face of the taped-together pieces. Now, where shown in Step 2, miter-cut the other end.

*Continued*



**7** Drill a pair of ¾″ holes through the taped-together pieces where indented to form the ends of the handle opening. (When drilling, we used a brad-point bit and backed the tray ends with scrap stock to prevent chip-out.)

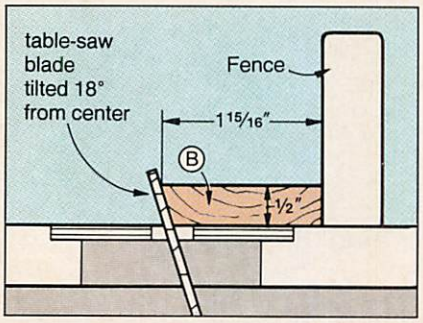
**8** Cut the handle opening in the template to shape. Trace the opening outline onto the top tray end, aligning the ends of the handle opening with the ¾″ holes. Now, using a jig saw or scroll saw, cut the handle opening to shape. With a small sanding drum or sandpaper wrapped around a ½″ dowel, sand the handle opening smooth.

**9** Cut the arched top of the taped-together tray ends to shape. Sand the arched top smooth to remove the saw marks.

**10** With the tray ends still taped together, rout a ¼″ round-over on the exposed face of each handle opening. (We routed the pieces on our router table.) Separate the pieces and remove the tape. Remove any sticky residue with thinner. Set the tray ends aside for now.

## NOW, FASHION THE TRAY SIDES

**1** Cut two pieces of ½″-thick oak to 2″ wide by 18″ long for the tray sides (B). Using the setup shown *below*, bevel-rip the bottom edge of each tray side at 18°.




**2** Tilt the blade on your table saw 6° *left* of vertical. Also, set your table saw miter gauge 18° left of center (see Step 1 on the drawing at *right* for reference). With the previously cut bevel facing up and against the miter gauge, miter-cut one end of each tray side.

**3** Attach an auxiliary fence to the miter gauge. Reset the miter gauge to 18° *right* of center where shown in Step 2. Next, clamp a stop block in position, and trim the opposite end of each tray end to a 16½″ finished length.

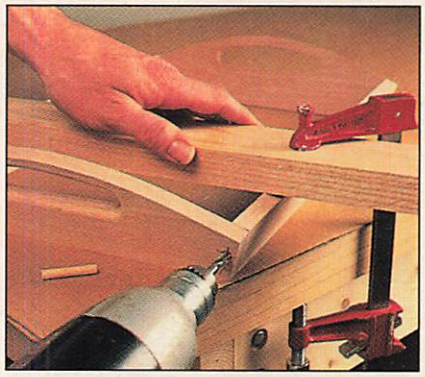
**4** Sand the ends (A) and sides (B).

## ASSEMBLE THE TRAY FRAME

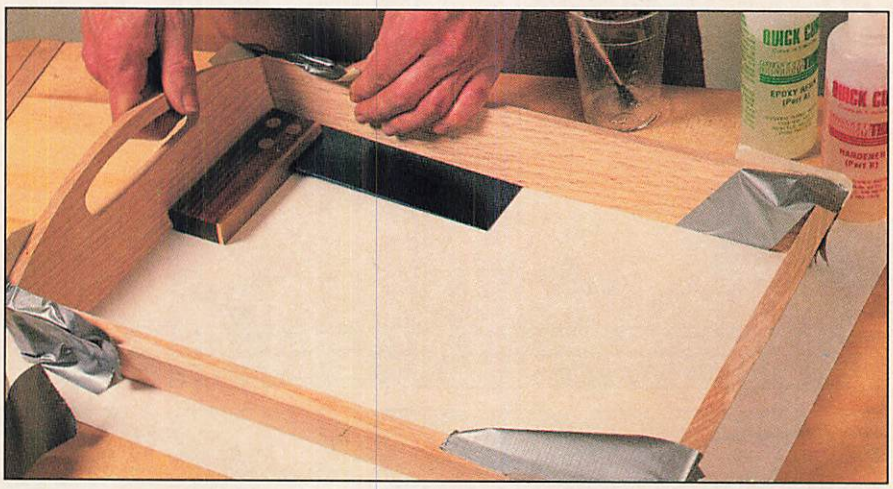
**1** Mix epoxy and apply to the mating edges—see the Buying Guide on the opposite page for our source of epoxy. As shown in the photo *below*, tape the frame joints tightly together with the bottom edges of the sides flush with the bottom edges of the ends. Check for square. Wipe off any excess epoxy. (Due to the difficulty in clamping angled joints, we used epoxy which requires only that the joints be held together flush.)

**2** After the epoxy has cured, remove the tape, scrape off any excess epoxy, and sand the joints smooth. Sand the top edges of the tray sides flush with the top edges of the tray ends.

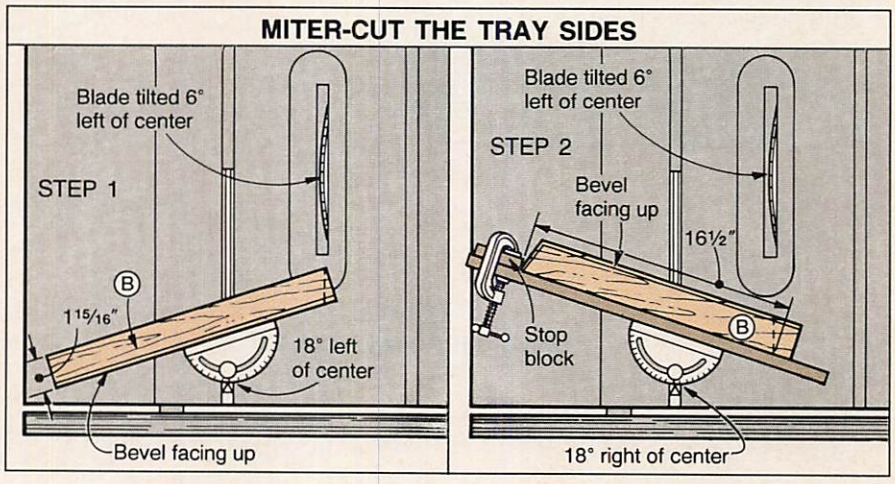
**3** Mark the center points of the 1/4″ dowel holes at each corner of the tray. (See the full-sized Half Pattern for hole locations.) Now, as



**Clamp the tray frame to a work surface, and drill the ¼″ dowel holes.**



**Tape the epoxied corner joints together tightly. Check that the bottom edges are flush and that the tray frame is square.**

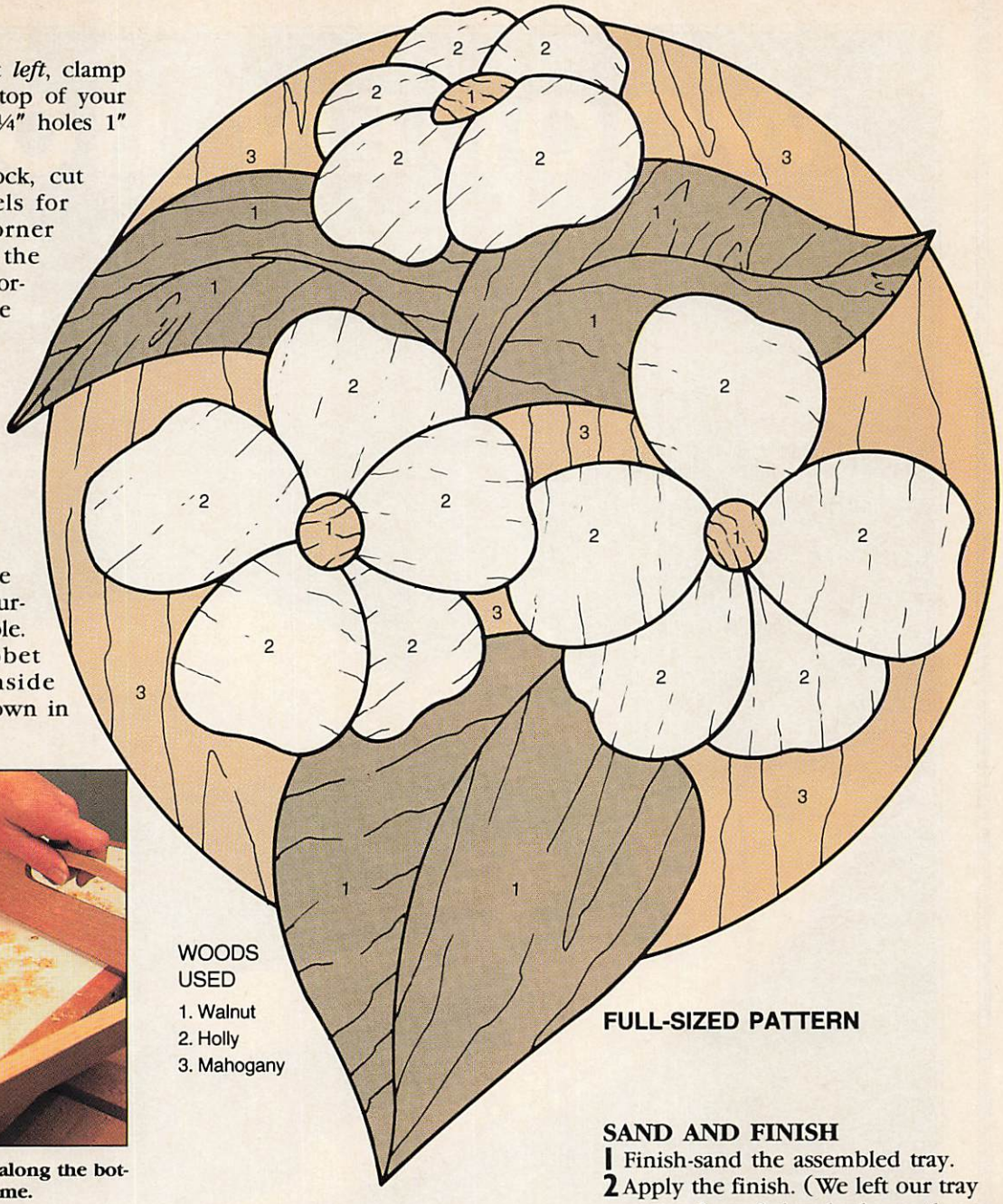


shown in the photo at *left*, clamp the tray frame to the top of your workbench, and drill ¼" holes 1" deep where marked.

**4** From ¼" dowel stock, cut eight 1¼"-long dowels for strengthening the corner joints. Wipe glue in the holes, and dowel the corner joints. Later, trim the dowels flush with the outside face of the tray (we used yellow woodworker's glue, and trimmed the dowels flush with a dovetail saw).

**5** Chuck a ¼" rabbet bit into your table-mounted router. Raise the bit ¼" above the surface of the router table. Then, rout a ¼" rabbet along the bottom inside edge of the tray as shown in the photo *below*.

**Rout a ¼" rabbet ¼" deep along the bottom inside edge of the frame.**




**FULL-SIZED PATTERN**

## ADD THE BOTTOM

**1** Measure the rabbeted opening, and cut the tray bottom (C) to size from ¼" oak plywood. Now, position the tray frame squarely over the tray bottom, and trace the rounded corners onto the tray bottom. Cut and sand the radiused corners to shape.

**2** Referring to the inlay-techniques article starting on page 42 and the full-sized flower and leaf pattern *above right*, cut and install the inlay pattern into the top center of the ¼" oak plywood. (See the Buying Guide at *right* for our source of walnut, holly, and mahogany veneer for the pattern.)

**3** Sand the finished tray bottom smooth, being extremely careful not to sand through the thin-veneer inlay pattern.

**4** Using woodworker's glue and spring clamps, glue and clamp the plywood bottom into the rabbeted opening in the tray bottom. Remove any excess glue immediately with a damp cloth. Sand the bottom of the tray frame flush with the bottom of the tray bottom.

## SAND AND FINISH

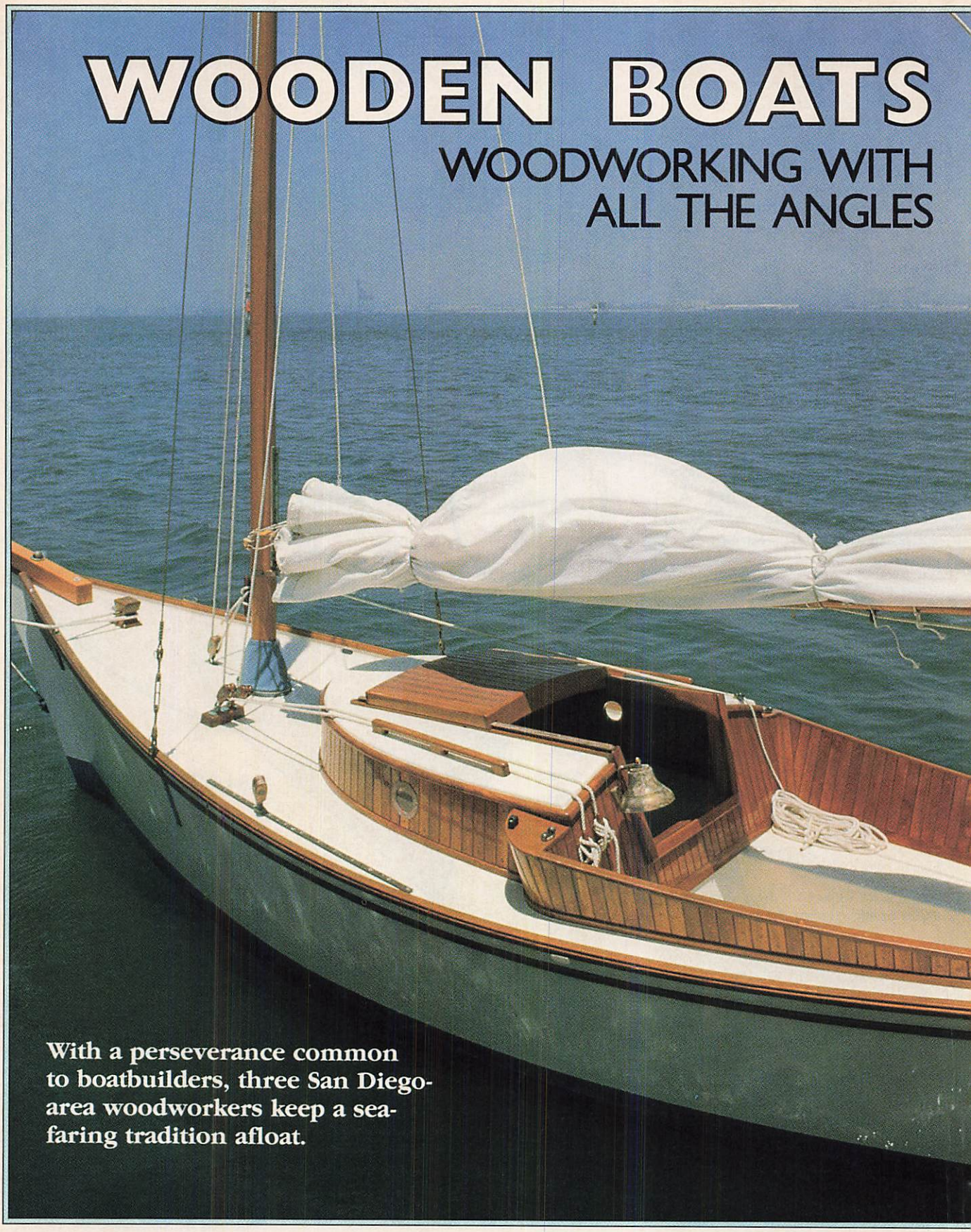
**1** Finish-sand the assembled tray.

**2** Apply the finish. (We left our tray unstained, and brushed on three coats of polyurethane.)

## BUYING GUIDE

• **Epoxy and veneer**. ½ pint of epoxy, catalog no. EP665. One square foot each of walnut, holly, and mahogany 1/32"-thick veneer. $16.85 ppd. from Constantine's, 2050 Eastchester Rd., Bronx, NY 10461. Or call 800-223-8087 (800-822-1202 in New York).

Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: Jim Kascoutas
Illustrations: Kim Downing; Bill Zaun



# WOODEN BOATS

## WOODWORKING WITH ALL THE ANGLES

**With a perseverance common to boatbuilders, three San Diego-area woodworkers keep a seafaring tradition afloat.**

Many of the venerable ways of the shipwright—the craftsman charged with framing and planking merchant vessels and men-of-war—vanished in the 1800s along with the days of commercial sailing. But, metal, plastic, and fiberglass haven't sunk the wooden boat.

Today's nautical craftsmen have adopted contemporary wood products, materials, and hi-tech adhesives. They have also learned new techniques to couple with time-honored know-how to preserve the boatbuilding heritage.

**"I love to build boats because of the type of woodworking involved. Everything is compound angles, compound curves. You can do a great deal without using levels and squares. You use your eyes."**

***Sam Radding, San Diego***

Passersby just sort of drop in on Sam Radding when he's building boats. His two-car garage workshop under an apartment faces side-street traffic. The interruptions aren't nagging, according to Sam, "If I was building boats down by the docks, boat owners would pester me to fix something."

Besides, who knows when a drop-in may buy Sam's 16′ wooden sailboat. He makes one boat at a time, and sells them for up to $10,000.

◀ **Sam (standing on block) chats with his helper, retired cabinetmaker Bill Gard. Rolling the boat out often draws a small crowd.**

◀ **Made of plywood covered with fiberglass and trimmed in teak, a 16′ sailboat by Sam Radding rides at anchor in San Diego Bay. Its big-boat lines fool the eye.**

▲ **Details such as the teak sunburst-patterned transom set Sam's boats apart from other small day sailers. Templates for boat parts line the wall behind the project in progress.**

## Joy in the shop

Sam, 41, once specialized in guitars and dulcimers, but now can't think of a thing he'd rather build than a boat. "Building a simple boat is a joy in itself. When you add things like a teak transom, carving, the little cabin, then it becomes fine furniture," he says.

Of his own design, the nearly completed vessel fits his description. "Look at any part of the boat—it all blends. I don't build boats that I wouldn't want to sail."

To perfect the lines, Sam relies on drawings and templates. "I'll take a scrap piece of wood and make a model of the part, and if it needs to be changed, I'll change it until it fits."

## Design dictates materials

Despite his design instinct, Sam is a woodworking realist. He knows high-priced small sailboats wouldn't sell. And materials raise prices. "I'm not a purist, though. If a design lends itself to exterior-grade plywood rather than the much more expensive marine plywood, make it out of exterior grade! This particular boat lends itself to exterior-grade-plywood-and-fiberglas construction—the sides are flat and it has a relatively flat bottom. Exterior-grade plywood works great if you fill the voids and protect it from moisture with epoxy."

*Continued*

# WOODEN BOATS

**"When I lived in Idaho, a New England friend saw a photo of me and sent a note: 'Boatbuilders in Boise look like those in Maine—poor and happy.' As a boatbuilder I've never been poorer, yet I've never been happier."**

***Art Hoban, Vista***

In his early forties, Art Hoban looks like he could play pro soccer, or on a whim, go climb the Andes. He's in great physical shape for either. First, though, he'll row one of his open boats down the Sea of Cortez to Mazatlán, Mexico. Or, he'll find a companion and set out around the world in his 18′ sailboat. Art loves water intensely, and builds cold-molded wooden boats to ply it. He pours his creativity into sailboats and the craft he calls "wherries."

"Wherries are related to the racing scull," he says. Art's recreational row boats, though, aren't as high-tech as racing sculls. His boats withstand rough water and owner abuse. "Sculls are 12″ wide, 24′ long—real stilettos. Hit a ripple, though, they're in trouble!" Art exclaims. "My single boats (for one person) are 16′ long, 39″ wide. The doubles run 24′ and 48″ wide. They have keels. They get dragged, dropped, rammed, and rolled."

In the last eight years, Art has built 20 single wherries. He sold one of his early ones to Jim Whittaker, the first American to climb Mt. Everest. Art isn't getting wealthy at the $2,500 each he asks for them. And, he won't sell plans. Building them himself is the only way to maintain quality control over the hulls.

The 24′ double may still be in the trial stage. "With this particular boat, I was working only from an idea, so I spent a lot of time looking like Rodin's statue, *The Thinker*."

## Laying up a cold-mold hull

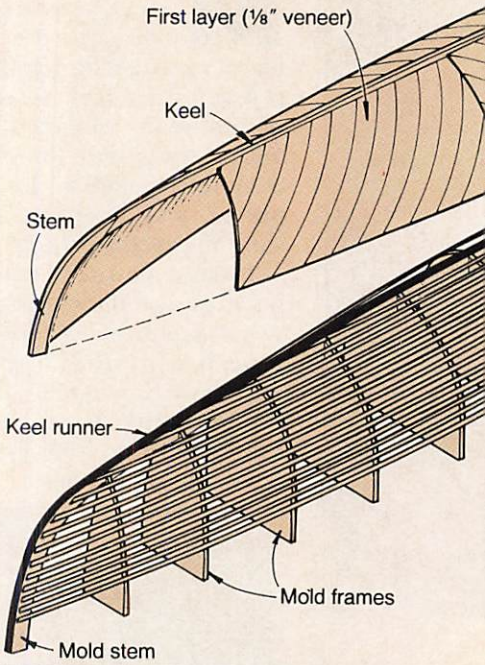
For strength, durability, and lightness in his boats, Art mastered the cold-mold process perfected by Michigan's boat-building Gougeon brothers. It begins with wood. "I rip ⅛″-thick western red cedar that I get from Oregon into strips 4″ wide, which I call planks.

"Then, in essence, this is what happens," Art goes on (see drawing, *above right*). "I have a plywood-framed, wood-mold hull covered with sheet plastic that acts as a mold release. I make the stem and keel from laminated mahogany, and rabbet the keel on each side to accept the cedar planks, and set it over the mold hull. Then, I lay the first layer of strips at 45° coming aft, toward the stern. Next, I put down epoxy for the second layer that goes forward at 45°. Staples hold it in place until the epoxy dries. After I pull the staples, another layer of epoxy goes down for the third layer, which overlaps joints of the first two layers and comes back aft," he notes. "After the staples come out, I have a shell.

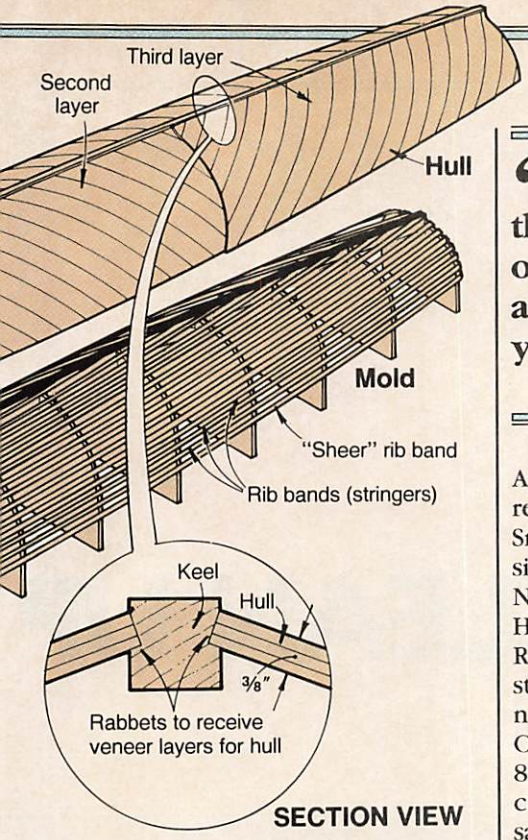
"When I pop it off the mold, I have triple-diagonal planking bonded with epoxy—no fasteners. That makes an incredibly strong hull that's only ⅜″ thick," Art continues. "On the inside and outside of the hull, I use a lightweight fiberglass cloth with three coats of epoxy resin over it as a sealer. Then, I rough it up on the inside and give it three coats of varnish. On the outside, I paint. That's all for UV protection. The 16′ single comes off the mold at 40 pounds."

Rather than one big future dream project in the back of his mind, Art has a constant stream. "My dream boats are an ongoing thing," he explains. "As soon as I finish one, there's another one to build."

**COLD-MOLD BOAT CONSTRUCTION**

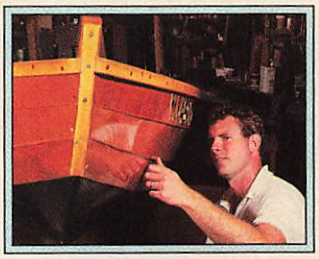


**▲ A three-layer hull of ⅛″-thick, epoxy-bonded cedar strips makes Art Hoban's rowing wherrie light, yet rugged. With two men rowing, Art believes the boat will do 20 nautical miles in 2½ hours.**



▲ The wherrie's deck sports poplar, teak, vertical-grain Douglas fir, and Sitka spruce. To allow for movement, Art filled between each plank with caulk. His oars carry Sweden's national colors.

**"With cabinets, you draw all the parts and dimensions out on paper, then cut them out and assemble them. A boat, you work one part at a time."**
*Art Mulvey, Oceanside*

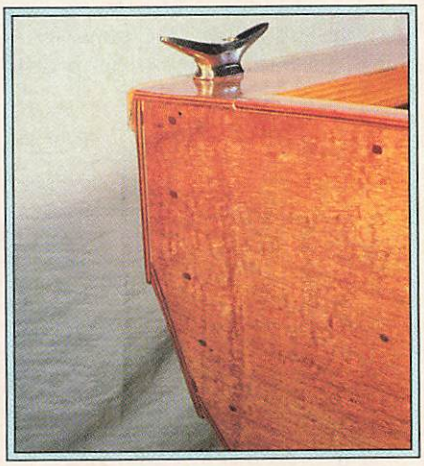


▲ Art's mahogany lapstrake boats boast a foot-deep finish.

Art Mulvey and his dad, Art Sr., represent a boatbuilding tradition. Art Sr. began building straightforward, simple, seaworthy wooden boats of New England design in the 1950s. He still builds them in his Hope, Rhode Island, shop. Art, Jr., 33, started there in high school, but now works cross-continent in Oceanside. In his garage, he builds 8′ blunt-nosed, flat-bottomed boats called prams, lightweight 10–14′ sailing/rowing boats referred to as skiffs, and 21′ outboard-powered, high-sided skiffs termed dories.

**Tradition meets technology**

Young Art believes in following the old, time-tested designs, with some modification. "All the designs have pretty much been passed down through the generations," Art explains. "But I change them just a little by giving them more width for greater stability and capacity.



▲ A transom view of a 14′ skiff shows how Art bevels the edge of the mahogany planks so they overlap on the hull, much like siding on a house. Brass trim and figured wood have eye appeal.

For instance, my 21′ dory measures about 7′ across the beam."

While adhering to classic design, Art incorporates up-to-date materials and methods. For instance, he rips the planks for his lapstrake boats—such as the 14′, made-to-order, $3,500 skiff shown—from a special multi-ply marine plywood called Bruynzeel African mahogany. He then bevels the planks to fit and fastens them to stout oak ribs—sometimes with only epoxy. "I use a saturating epoxy, brushed on both sides, that adheres the planks to the frame," Art says. "That way I don't have to use screws or other fasteners." A layer of fiberglass on the plywood bottom and a coat of epoxy make a watertight boat.

Three coats of spar varnish over the epoxy base equals the depth of 10 coats of varnish, according to Art. "The epoxy gives it body and it creates an easily maintained finish (see photo, *above*)."

Custom cabinetry, furniture, and boat repair fill the gaps between Art's boats—and despite the differences, he likes them all equally. "With a boat, when you come to a part or section, you have to stop, figure it, and work it out—you have to fit it," he comments. "When you do both cabinets and boats, you have to learn two different ways of thinking."

*For more information about the boats described in this article, drop the builders a line:*

Sam Radding, 6104 Adams Ave., San Diego, CA 92115; Art Hoban, 512 W. California Ave., No. 205, Vista, CA 92083; Arthur F. Mulvey, 1620 Alvarado St., Oceanside, CA 92054.

Produced by Peter J. Stephano

# SHOP VACUUMS

# THEY'LL CLEAN UP

**If you were embarrassed to show off your shop the last time friends dropped by, maybe you should consider a shop vacuum to simplify cleanup chores.**

Incredibly versatile, today's wet/dry shop vacuums can pick up water as well as sawdust, dirt, nails . . . you name it. In fact, keeping the shop vacuum in your shop might be the only problem you have when other family members discover it.

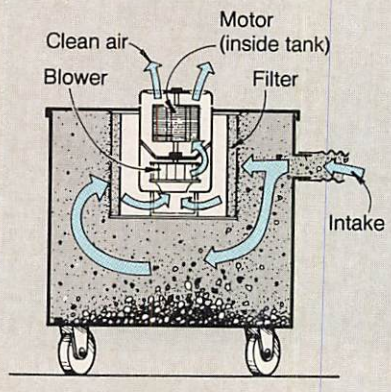
Two companies dominate the shop-vacuum market: Shop-Vac Corporation and Sears. Shop-Vac manufactures a complete line of machines in its 3 U.S. and Canadian plants, covering nearly every residential and commercial need. It also private-labels the machines sold by most of the other companies in the market. Emerson Electric makes Sears shop vacuums.

## HOW SHOP VACUUMS WORK

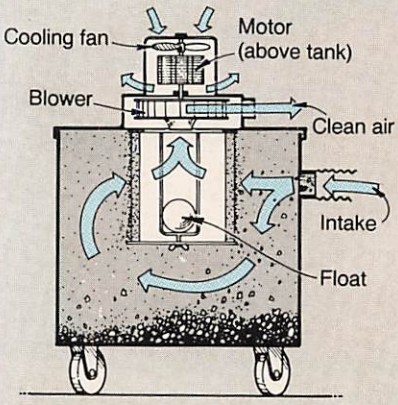
Basically, all shop vacuums consist of little more than a motorized fan and a tank. When you flip the switch of one of these debris-gobbling machines, the fan blows filtered air out of the tank, creating a vacuum within the tank. At the same time, air rushes into the tank through the hose to fill this void, drawing debris with it. Heavier material drops to the bottom of the tank, and a filter traps the finer particles as they try to exit.

As you can see by the cutaway illustration *below*, dry-pickup-only units draw filtered air directly through the motor—if a filter tears, dirty air will enter the motor housing and possibly damage it. Wet/dry units, on the other hand, have a bypass motor system, meaning the air drawn into the tank exits the tank without coming in contact with the motor (see illustration *below*). A small fan, completely separate from the blower, cools the motor.

Also, wet/dry machines have motors mounted on the outside of the




**In *dry-pickup-only* machines, filtered air cools the motor as it's channeled out the top of the vacuum.**

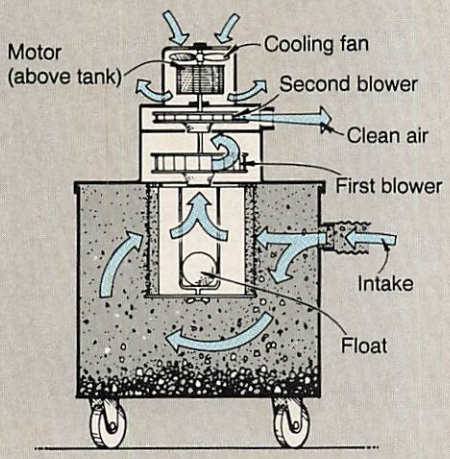



**Cleaned air bypasses the motor in *single-stage wet/dry* systems. A float protects the motor from water.**

# UMS ANYBODY'S ACT

tank, protecting them from water within the tank. A float within the filter assembly rises with the water, sealing the opening between the tank and the fan housing.

To push air through one of these refuse-eaters, today's wet/dry vacuums have either one blower (single-stage) or two (two-stage). Two-stage shop vacuums (see illustration *below*) increase the lifting power of the shop vacuum because a larger blower first brings in a volume of air, then a smaller blower pushes out the already-compressed air.




***Two-stage wet/dry*** **vacuums have a second blower that increases the machine's ability to draw up heavy material, such as water.**

## ARE THEY A SUBSTITUTE FOR A DUST COLLECTOR?

You can hook up shop vacuums to woodworking machinery such as a belt sander for dust removal, but they won't work for as long a continuous period as dust collectors. Shop vacuums use brush-type universal motors designed for intermittent duty, whereas dust collectors use continuous-duty induction motors.

Compared to shop vacuums, full-time dust collection systems will move a greater volume of air, but they won't pick up heavy materials such as nails or big wood chips. Because a shop vacuum moves a much smaller volume of air, you should only hook a vacuum up to one machine at a time.

Price-wise, shop vacuums range from $30 to $850 generally, but we found that models in the $70 to $140 range will perform well in most home shops. Portable dust collectors, on the other hand, will cost you at least $200.

*Continued*

# WHAT TO LOOK FOR IN A VAC

### SUCTION: THE #1 CONSIDERATION

Three factors determine the suction power of a vacuum: static pressure, volume flow rate, and the size of hose attached to the vacuum. Static pressure (sp) reflects the *lifting power* of a vacuum—a high sp rating means a machine will lift heavier material than a machine with a low sp number. Volume flow rate means the *amount of air* that a vacuum will move, expressed in cubic feet per minute (cfm). Hose size affects both sp and cfm. As a hose becomes longer and narrower, sp increases and cfm decreases.

The combination of these three factors determines the best use for a particular vacuum. For sawdust removal from operating machines, a vacuum must inhale a large volume of air at a fast rate, requiring a high cfm number (dust collectors have very high cfm numbers).

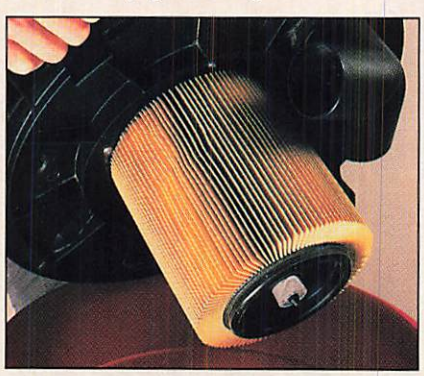
Because shop vacuums have to also lift heavy materials, such as water, nails, or metal shavings, they also have high sp ratings compared to a dust-collection system.

Even the least expensive models we looked at had high cfm numbers and will do a good job of dust removal. The cost of a vacuum climbs as its sp rating goes up, but if you want to pick up heavy materials in one pass, look for a vacuum with an sp rating of at least 50.

### PLEATED OR DOUBLE FILTERS—WHAT'S BEST?

You'll find two designs of shop-vacuum filters: one-piece pleated paper cartridges, or double filters with a foam or cloth core and surrounded by a paper or cloth bag. The double filters clean easily, but because of relatively little surface area, will clog rapidly when picking up plaster or sanding dust.

Pleated paper cartridges, on the other hand, won't clog as readily because of their large surface area. However, once wet, they take a long time to dry, and any dust on them will dry to a solid crust. We recommend a pleated filter for strictly in-the-shop use, where water is rarely picked up.



**Because of greater surface area, pleated cartridges won't clog from fine dust as quickly as foam and paper filters.**

**The Shop-Vac 900-60's dust bag lifts from the tank, making it a snap to clean.**

### THE NOISE FACTOR

There's no getting around it: Shop vacuums make a lot of noise. However, some models scream louder than others. To find out how much noise they make, we tested the 10 machines we brought in for this article with a decibel meter. The loudest bellowed forth 85 decibels (dB); the quietest came in at 76 dB (see the results in the chart on *page 61*). To our ears, 76 dB was acceptably noisy; 85 dB was loud and downright uncomfortable.

The Shop-Vac 984-02 and 900-60 (at 77 and 76 dB) were the quietest machines we tested, but both list price over $400. Among models under $150, the variable-power Sears 17921 was the only unit under 80 dB (79 dB at full power).

# OTHER POINTS TO

### USE THE RIGHT HOSE FOR THE JOB

In the workshop, you'll need a 2½" hose for collecting sawdust off surfaces or directly from your machinery. Smaller hoses restrict air flow, thus reducing the quantity of dust extracted. Also, larger chips will be less likely to clog a 2½" hose. Finally, many stationary woodworking machines have 2½" dust ports. (Shop-Vac makes both 2½" to 1½" and 2½" to 1¼" hose adapters.)

For drawing up water, you'll need a 1¼" or 1½" hose. The smaller diameter creates the pressure necessary to lift liquids.

### TANK CAPACITY AND CONSTRUCTION

Shop vacuums range in capacity from 5 to 55 gallons. If you'll be using a shop vacuum as a dust collection system for a surface planer, for example, you may be surprised at how fast a 10-gallon tank fills. Constantly emptying the tank can be a nuisance, but if you're using the vacuum in conjunction with a machine that produces a small amount of sawdust, such as a belt sander, a small tank will handle it.

Also, consider the material of a tank (fiber, plastic, steel, or stainless steel). Fiber (cardboard) containers, made for dry pickup only, range up to 28 gallons. They offer large capacity, low weight, and low price. Fiber containers puncture easily, however, and also will burn if a hot metal filing were to enter the tank and ignite sawdust or other debris. The material also will rot if exposed to damp conditions.

Plastic (the most common material for tanks) works well for water pickup, but may melt from heat or solvents. Its exterior also attracts a lot of dust through static electricity, making cleaning it a chore. On the plus side, it's lightweight, will not dent, and will last forever if not abused. All in all, we find plastic tanks to be the best option for the home wood shop.

# CONSIDER BEFORE YOU BUY

Though it will not burn or melt, steel has the disadvantage of being heavier, and will rust if its protective coating is scratched. If dented near the rim, steel tanks will leak air, making the unit less efficient.

Stainless steel has the advantages of steel without the possibility of corrosion. It's also harder to dent, but will put a real dent in your wallet—you'll pay at least $300 for a stainless-steel-tank vacuum.

### ATTACHMENTS: LOTS TO CHOOSE FROM

For almost any vacuuming job, there's an attachment that will help—most types come in 1¼", 1½", and 2½" sizes. Shop-Vac offers the most complete line of these attachments, but their add-ons will fit other makes as well. Lightweight plastic attachments work well, but may crack or melt. Their more-durable metal counterparts cost more. For the home workshop, plastic attachments should easily outlive the vacuum itself, making them the practical choice.

You'll find the attachments shown *below* will help you do most jobs. For vacuuming floors, or reaching high places, you'll need extension wands. Here are a few others you might find useful: squeegee nozzles for drawing up water, brush nozzles for floors, carpet nozzles, and crevice tools for tight spots. You'll find a small round brush attachment invaluable for vacuuming sanded surfaces.

### THE IMPORTANCE OF MOBILITY

Since a shop vacuum will likely see duty all around your home, make sure it can easily go where needed. Vacuums move about in two ways: on four small casters, or push carts with one or two casters in front and two fixed-axle wheels in back.

**For average home shop use, you don't have to spend more than $150 to get a shop vacuum that will efficiently handle nearly any job.**

The caster units tend to wander as you pull them, but the push carts will move in a straight line when pulled because of their non-pivoting wheels. Also, their handles and large rear wheels enable you to easily move them up and down stairs. We suggest spending the extra money for a push cart only if you often move the vacuum up and down stairs.

### WARRANTIES: SHOULD YOU BUY EXTENDED COVERAGE?

Genie, Sears, and Shop-Vac provide a one-year warranty with their products. Sears sells an optional maintenance agreement that covers anything that could happen to the machine for two or three years. The price ranges from $21–33 for each additional year of coverage up to two additional years, depending on your region, so check with your local store. Under the Sears plan, even if you run over your unit with a car, Sears will replace it free of charge. This plan covers filters ($12.99 each), so if you often clean up fine dust or water, this route may make sense for you.

### WHICH MODEL DO YOU NEED?

If you're interested purely in dust removal from your stationary machinery, a dust collector is your best bet. But if you would like a machine that can remove dust from one machine at a time, and clean your entire shop while performing service throughout your home, a shop vacuum is for you

For average home shop use, you don't have to spend more than $150 to get a shop vacuum that will efficiently handle nearly any job. Our recommendation: Buy a wet/dry machine (because of its bypass motor, even if you won't be picking up water) with a capacity of at least 15 gallons, and suction of at least 50 sp and 130 cfm. For attachments, consider these essential: a 2½" hose, extension wands, crevice tool and floor nozzle.

**These accessories will maximize the versatility of a shop vacuum. From left to right: extension wand, 2½" hose, 1½" hose, crevice nozzle, squeegee nozzle, floor nozzle, carpet nozzle (attached to wand), and dust brush.**

*Continued*

# VACUUMS

## HERE'S THE LOWDOWN ON THE 10 MODELS WE TESTED

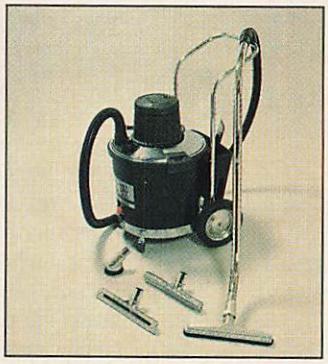
**Sears 17964**
This machine (*foreground, right*) packs lots of suction, and creates less noise than the Sears vacuums of a few years ago. A hose port pointing horizontally from the blower housing, along with large handles, makes the machine convenient to use. One caution about the handles: Don't grab the tank-release catches inside them as you pick up the machine. If you do, the tank will fall to the floor.

**Sears 17921**
Plenty of power and two distinctive features make this unit (*background, right*) clean up on the competition in its price range. Its variable power control (labeled "variable speed") allows you to dial-down the suction and noise level, making the machine invaluable for working around thin veneers or small objects that might get sucked into a stronger-running vacuum. It also features a handy retractable cord.

**Genie PHD-1626**
The Genie unit (*center, left*) that we tested drew plenty of air (140 cfm) considering its low price ($109.95 list), but we did notice a few drawbacks. It didn't lift heavy materials (45 sp), and its thin, puncture-prone hose collapses under the slightest back pressure. We also found emptying the tank awkward because the hole in the top of the tank is smaller than the diameter of the tank.

**Sears 17990**
Sears' top vacuum has many features found only on the better Shop-Vac models, such as steel extension wands and aluminum attachments.

Assembling the cart proved to be difficult—there were lots of small parts and unclear instructions. Emerson Electric's Vicki Vanderford told us that they're developing a cart with 90 percent less parts and better instructions.



**Shop-Vac 984-02**
Designed for general use rather than purely in the shop, this unit has a standard 1½" hose. It has strong static pressure (105 sp—thanks to its 3.5 peak hp two-stage motor), low noise, stainless steel tank, well-built accessories, and a price tag to match: $854.95 list. We like its hose storage cage and curved wand that enables you to stand while vacuuming under objects.

**Shop-Vac 900-60**
Like the Shop-Vac 984-02, here's another unit probably more at home in a convention center or hotel. Nevertheless, it has several features we'd like to see on workshop vacuums. A cloth bag fits around the rim of the tank and forms the first part of its filtration system. The bag can be shaken free of dust by just lifting a tab in its center, as shown on *page* 58. It was the quietest machine we tested (76 dB).

**Shop-Vac 634-00 and 411-01**
Two key differences separate these otherwise-similar dry-pickup-only machines. First, the size of tank. The 634-00 (shown on *left*) can be purchased with a 55-gallon steel drum—the 411-01 has a 28-gallon fiber tank. Second, the number of motors (the 634-00 has two that run together or intermittently, the 411-01 has one). High tank capacity helps both of them do double-duty as dust collectors.

**Shop-Vac 850-03**
Standard features on this steel-tank model (shown on *left*) include 2½" and 1¼" hoses. Its loud (84dB) motor develops low suction (42 sp and 135 cfm).

**Shop-Vac 464-38**
Like the 850-03, it comes standard with hoses in both sizes. It's also one of Shop-Vac's least expensive two-stage models at $249.95 list.

**MANUFACTURERS LISTING:**

**Genie**
JetVac Division
22790 Lake Park Blvd.
Alliance, OH 44601
216/821-1221

**Sears**
For more information, contact nearest store.

**Shop-Vac**
P.O. Box 3307
Williamsport, PA 17701
717/326-0502
or
**Shop-Vac West**
P.O. Box 19368
Irvine, CA 92714
714/863-1506

# CLEAN FACTS ABOUT TODAY'S SHOP VACUUMS

| MANUFACTURER | MODEL NUMBER | TYPE[1] | NUMBER OF FANS[2] | BLOWER: STATIC PRESSURE[3] (SP) | BLOWER: VOLUME FLOW RATE[4] (CFM) | MOTOR: AMPS | MOTOR: PEAK HORSE POWER | TANK: MATERIAL[5] | TANK: SIZE (GALLONS) | NOISE[6] | FILTER TYPE[7] | STANDARD HOSE SIZE(S) (DIAMETER-IN. × LENGTH-FT.) | WHEELS[8] | STANDARD ACCESSORIES[9] | CORD LENGTH (FT.) | FEATURES: BLOWING CAPABILITY (Y, N) | FEATURES: DRAIN (Y, N) | WEIGHT (LBS.) | SUGGESTED PRICE[10] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AEG | V-2.5WD | W | 1 | 46 | 200 | 9.5 | 2.5 | P | 16 | N/A | FCB | 2½×6 | C | CT, FN, GN WN, XW | 18 | Y | N | 25 | $239 |
| Black & Decker | 5433 | W | 2 | 102 | 103 | 7.2 | 2.0 | P | 10 | N/A | CP | 1½×10 | PC | AT, FN, SS, WN, XW | 25 | Y | Y | 67¾ | 769 |
| Black & Decker | 9462 | W | 1 | 50 | 100 | 7.4 | 1.1 | S | 8 | N/A | FP | 1¼×6 | C | GN, WN, XW | 6 | Y | N | 16¼ | 137 |
| Bosch | 1702 | W | 2 | 80 | 102 | 9 | 2.0 | S | 10 | N/A | FCB | 1½×12 | PC | GN | 18 | Y | N | 48 | 359 |
| Delta | 49-255 | W | 2 | 75 | 109 | 7.5 | 1.7 | F | 28 | N/A | CP | 2½×6 | CP | GN | 8 | Y | N | 24 | 189 |
| Genie | PHD-1626 | W | 1 | 45 | 140 | 7.3 | 1.5 | P | 16 | 85 | FCB | 2½×6 | C | CT, FN, GN, WN, XW | 18 | Y | N | 24 | 110 |
| Jet | JV-10 | W | 2 | 80 | 100 | 7.5 | 1.75 | SS | 10 | N/A | CP | 1½×12 | PC | CN, FN, GN, HC, WN, XW | 18 | Y | N | 55 | 332 |
| Milwaukee | 8955 | W | 1 | 50 | 121 | 7.4 | N/A | S | 10 | N/A | PPC | Hose Optional | PC | None | 18 | Y | N | 32 | 279 |
| Milwaukee | 8925 | W | 2 | 105 | 110 | 10 | N/A | SS | 15 | N/A | CP | Hose Optional | PC | None | 30 | Y | Y | 53 | 840 |
| Sears | 17990 | W | 1 | 50 | 165 | 10 | 2.5 | P | 16 | 80 | PPC | 1½×10 | PC | AT, CN, CT, DB FN, WN, XW, SS | 15 | Y | Y | 72 | 350 |
| Sears | 17831 | W | 1 | 50 | 160 | 10 | 2.0 | P | 16 | N/A | PPC | 2½×7 | PC | AN, AT, CT, GN, H, WN, XW | 15 | Y | Y | 30 | 250 |
| Sears | 17967 | W | 1 | 50 | 165 | 10 | 2.5 | P | 32 | N/A | PPC | 2½×7 | C | AN, CT, GN, WN, XW | 15 | Y | Y | 40 | 170 |
| Sears | 17921 | W | 1 | 50 | 165 | 10 | 2.5 | P | 16 | @ 79/75/74 | PPC | 2½×7 | C | AN, CT, GN, WN, XW | 15 | Y | Y | 31 | 140 |
| Sears | 17964 | W | 1 | 48 | 160 | 10 | 2.0 | P | 12 | 83 | PPC | 2½×7 | C | AN, CT, GN, WN, XW | 15 | Y | Y | 24 | 98 |
| Sears | 17941 | W | 1 | 42 | 120 | 6 | 1.5 | P | 6 | N/A | PPC | 1¼×6 | C | AN, CT, GN, WN, XW | 6 | N | N | 14 | 47 |
| Shop-Vac | 984-02 | W | 2 | 105 | 110 | 11 | 3.5 | SS | 15 | 77 | FCB | 1½×12 | PC | CN, FN, HC, SS, WN, XW | 18 | Y | N | 62 | 855 |
| Shop-Vac | 900-60 | W | 2 | 80 | 100 | 7.4 | 2.0 | SS | 10 | 76 | FCB | 1½×12 | PC | CN, CT, DB, FN GN, WN, XW | 35 | Y | N | 32 | 490 |
| Shop-Vac | 970-06 | W | 2 | 83 | 102 | 9 | 3.0 | # | — | N/A | PPC | 1½×12 | * | GN | 18 | Y | Y | 30 | 380 |
| Shop-Vac | 464-38 | W | 2 | 80 | 100 | 8.5 | 2.0 | P | 12 | 82 | FCB | 1¼×7 2½×7 | C | B, CN, CT, FN GN, WN, XW | 18 | Y | N | 19 | 250 |
| Shop-Vac | 850-03 | W | 1 | 42 | 135 | 7.4 | 1.5 | S | 20 | 84 | FCB | 1¼×7 2½×7 | C | B, CN, CT, FN GN, WN, XW | 18 | Y | N | 25 | 230 |
| Shop-Vac | 808-16 | W | 1 | 42 | 135 | 7.4 | 1.5 | P | 16 | N/A | FP | 2½×6 | C | GN, XW | 12 | Y | N | 25 | 130 |
| Shop-Vac | 600-01 | W | 1 | 50 | 100 | 7.4 | 1.1 | P | 5 | N/A | FP | 1¼×6 | C | GN, WN, XW | 6 | Y | N | 12½ | 80 |
| Shop-Vac | 634-00 | D | 2 | 75 | 165 | 16 | 1.7 | # | — | 79 | CP | 2½×6 | * | GN, XW | 18 | Y | N | 26 | 345 |
| Shop-Vac | 411-01 | D | 2 | 75 | 109 | 7.5 | 1.7 | F | 28 | 79 | CP | 2½×6 | * | GN, XW | 8 | Y | N | 24 | 205 |

1. (W)et/Dry (D)ry only
2. Referred to as 1-stage or 2-stage
3. Inches of water a vacuum will draw up a hose (mfr. ratings)
4. Cubic feet of air per minute (CFM) through a 2½" orifice
5. (P) Plastic, (SS) Stainless Steel, (S) Steel, (F) Fiber, (#) Head assembly only - 55 gallon steel drum available
6. Decibels (dB) from 6 feet away @ - high/medium/low power settings
7. (CP) Cloth and paper (FCB) Foam inside cloth bag (FP) Foam and paper (PPC) Pleated paper cartridge
8. (C) Casters (PC) Push cart (*) Casters optional
9. (AN) Auto nozzle, (AT) Accessory tote, (B) Both 2½" and 1¼" accessories standard, (CN) Carpet nozzle, (CT) Crevice tool, (DB) Dust brush, (FN) Floor nozzle, (GN) General-purpose nozzle, (HC) Hose cage, (SS) Stainless-steel accessories, (WN) Wet nozzle, (XW) Extension wand
10. Many vacuums discounted 10–30% below list

N/A - Not available

Written by Bill Krier Technical consultant: George Granseth Photographs: Jim Kascoutas Illustrations: Bill Zaun

## A HUNTING WE WILL GO

*Walter J. Morrison, 44 • Northport, New York*
*Electrical engineer*

Walter had a slight problem building his 18×7×27″ pine reproduction of an antique hunter's ammunition chest. "The stock for the doors is only ¾″ thick," he notes, "so I had about ¼″ of wood to carve in—going deeper would have warped the door."

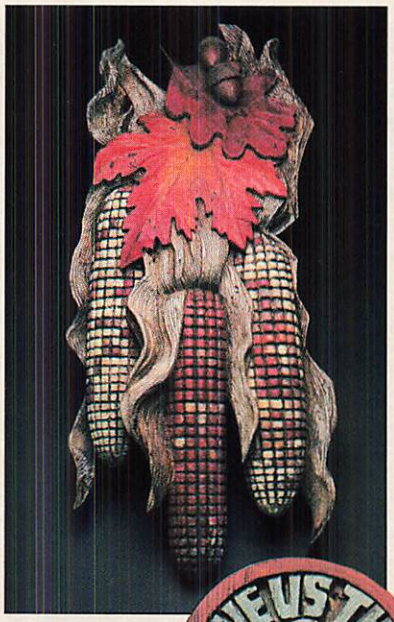
Instead of carving that deep, he gave the impression of depth with design. The door has a large foreground at the lower right and progressively smaller and shallower figures toward the top left.

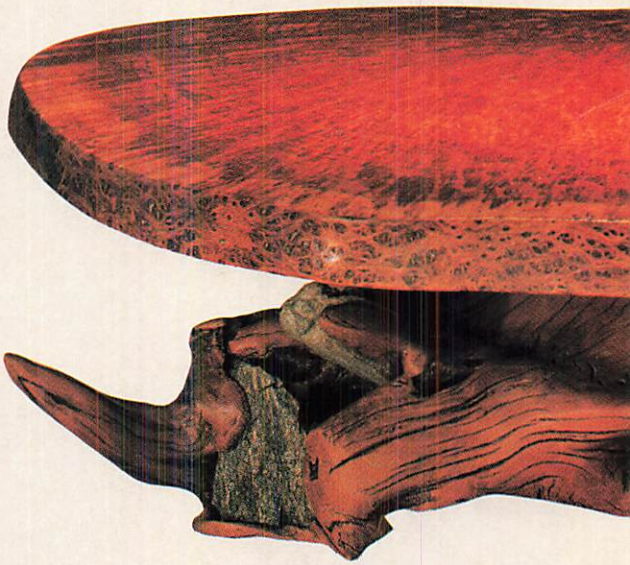
Because the doors extend ½″ below the frame, Walter eliminated the need for pulls. Magnetic catches hold the doors tightly closed.

For contrast on the carved doors, he laid down walnut stain, then wiped it from the flat surfaces. He finished his cabinet with clear varnish. Walter, you sure hit the target!

## PICK A PAIR OF CARVINGS

*Robert Thomas, Jr., 67*
*Columbia, Maryland*
*Retired graphic designer*





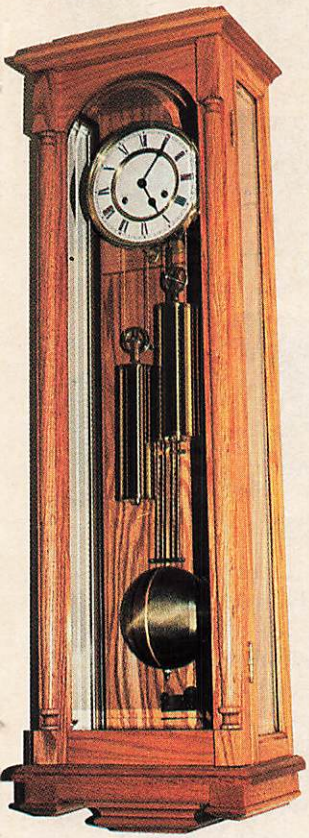
Selecting readers' work for this feature is *never* easy. But when someone like Robert submits a dozen high-quality projects to choose from, the task becomes nearly impossible. That's why you get to see two pieces of his work—we couldn't pick just one!

Robert says he's had a longstanding love affair with wood. From a look at his carvings, it responded.

A graphic's background fuels Robert's designs and color schemes. And skill powers his carving tools. Robert carved the full-sized replica of hanging Indian corn and fall foliage in basswood. He crafted the handsome "bread" plaque from 1½″-thick pine. It measures 8½×15½″. Robert painted both pieces with acrylics.

**To submit your projects . . .**
Send a 35-mm color slide with the project as the focal point and a simple background—no people. Include a description of materials, joinery, finish, and dimensions. *WOOD®* magazine will pay $25 for published projects. Slides cannot be returned unless you enclose a self-addressed, stamped envelope. *We publish readers' projects for recognition only. Sorry, we cannot supply plans or information about projects shown.*

# SHOWCASE



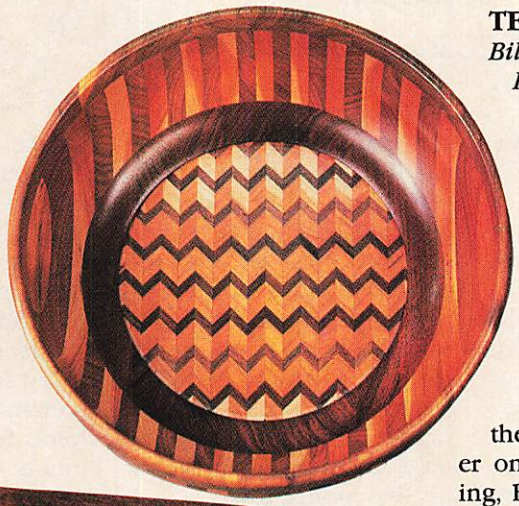
## WORKING AROUND THE CLOCK

*Jerry Duh, 34 • Indianapolis, Indiana • Firefighter*

Two days off between 24-hour shifts at the fire station gave Jerry a timely advantage—plenty of concentrated hours to tackle a big project. And his replica of a 19th-century Vienna regulator clock turned out to be exactly that.

Jerry built the 12¾ × 8 × 42″ clock from blueprints. Except for substituting red oak for the recommended wood, Jerry didn't deviate from the plans. None of the required woodworking tasks proved difficult, Jerry says, although he found the first-time reading of blueprints quite a challenge. "From a side view," Jerry notes, "a mortise and tenon become three lines."

Jerry's craftsmanship proved meticulous, though. His advice: "Go slowly."



## TEACHER'S HOMEWORK

*Bill Badland, 63 • Morro Bay, California*
*Retired high school shop teacher*

Bill didn't teach woodturning in his school shop class—he saved it for homework. For this assignment, he alternated layers of walnut and cherry in a laminated turning block that eventually became this 14″-wide by 6¾″-tall bowl.

Bill says he made the herringbone-patterned bottom much like a chess board: "I cut and alternately lined up ¾″ cherry and ¼″ walnut, then sliced through the strips at 45° angles, flipped over every other one, and laminated them." After finish-sanding, Bill wiped on tung oil, then paste wax.

## FINISH A MILE DEEP

*Scott Hower, 35, and Dan Silknetter, 28*
*Millersville, Pennsylvania*
*Woodworkers*

At Scott and Dan's Mad River Redwoods Company, tables like this draw gasps. That's when their hand labor pays off. The woodworking duo personally select prime Northern California redwood specimans to slice into slabs with a chainsaw, then truck the chunks to their Pennsylvania shop.

Called "Nymph's Wing," the table shown measures 45 × 25 × 16″. The 3″-thick top is redwood lace burl. Roots from a black locust tree form the base.

Scott and Dan accent features with a flexible disc grinder, chisels, rasps, wire brushes, and even flame. As many as 12 coats of Zar polyurethane followed by a final polishing with automotive buffing compound "produces a durable finish with the beauty of a French polish," they say.

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# FOUR CORNERSTONES

Despite the best intentions, more than 300,000 persons rush to hospital emergency rooms each year, victims of serious home workshop accidents. On top of that, says the National Safety Council, two to three times that number go unreported. We think these sobering statistics are reason enough to offer you a short shop safety review.

Teachers, experienced woodworkers—even your dad—no doubt passed along safety guidelines on numerous occasions. Our five safety experts spell them out again, because they're worth repeating, again and again.

## RULE 1: KEEP A SHIPSHAPE SHOP

**"Good workshop lighting is essential. Light fixtures should provide clear vision with a minimum of shadows in work areas and over machines."**

*Phil Schmidt, section head, National Safety Council*

Besides adequate light, Schmidt advises you to set up your shop to allow ample space for your stationary tools. "There should be no danger of bumping into one machine while using another," he says.

Minimize tripping, slipping, or falling by stowing idle tools and sweeping up around your machines every 30 minutes or so. To avoid cuts and splinters, clear saw tabletops of sawdust and scraps with a brush or shop vacuum, rather than your bare hands, suggests the NSC staff. And, store materials and parts out of the way.

Always turn off and unplug machines while adjusting them and changing blades or bits. But never unplug a power tool by giving the cord a jerk or drag a tool around by its cord. This eventually wears on the connection.

Make sure everything is electrically safe, too, the NSC says. All power tools should have three-pronged plugs, except double-insulated tools. And install ground-fault circuit interrupters (they may be required by your local electrical code). Finally, check for underpowered circuits overloaded by numerous power tools.

## RULE 2: DRESS FOR WOODWORKING SUCCESS

**"Watch those precious eyes—you have two for a lifetime!"**

*Bob Hempy, product planning manager, Delta*

"The sharp, spinning steel of a table saw, the grit of a sander, the wood bits from a lathe, dictate that you wear safety glasses or goggles that provide side protection with shields," emphasizes Hempy. "Eye protection is always a must, even with most hand tools. And, you need a face mask for dust protection."

Heber Anderson, Black & Decker's product training manager, says that "People have actually died by getting a tie caught and pulled into a lathe. So, dress appropriately. Avoid wearing loose clothing, long sleeves, jewelry, and gloves while working with power tools, particularly lathes and routers."

Adds the NSC's Schmidt, "Keep long hair out of the way with a close-fitting cap or net. Shoes with rubber soles provide better support and protection from slipping, as well as from sharp objects on the floor. If there's a danger of heavy objects falling on your feet in your shop, wear industrial-type shoes with steel safety toes."

Protect your hearing with disposable earplugs, reusable earplugs, or cushioned muffs when you use power saws, jointers, or routers. Some routers, for instance, can exceed the 85-decibel threshold for hearing loss established by OSHA, the government's industrial safety watchdog. While you would have to endure that high pitch for several hours to sustain injury, with all the other noise you subject your ears to, why take chances?

# OF SHOP SAFETY

## RULE 3: RESPECT YOUR TOOLS

**"If you get into a 40-tooth saw blade turning at 5,800 rpm, more than 1,288 teeth will pass through your hand before you can move it."**

*Heber Anderson, national product training manager, Black & Decker*

According to Anderson, vivid facts instill caution. "If everyone thought of that saw blade in terms of what all those teeth can do, they'd pay a table saw more respect," he says.

Overconfidence contributes to accidents, according to Anderson. "We see people who have handled tools all their lives become almost as dangerous as a novice," he says very concernedly.

Delta's Hempy couldn't agree more. "Lack of respect for the machine, repetitious work, and working with the blade guard removed often result in a finger or hand in the blade."

Another Delta safety professional, Mat Ros, product safety manager, suggests ways to avoid potentially nasty table-saw accidents:

- Leave the blade guard on when sawing.
- Use protective jigs, featherboards, and push sticks.
- Don't rip boards without clamping the rip fence.
- Avoid blade binding or kicking by only making crosscuts with the help of the miter gauge.
- Never reach around or over the blade.

Making tools do a job they weren't designed to do causes injuries, too. "For example," says Jim Elmore, Stanley Tool Division's manager of product safety, "people commonly use a screwdriver for a pry bar, and it can break."

Beware of dull cutting tools, too. A dull saw blade overheats, sticks, and kicks, more than a sharp one.

## RULE 4: GIVE WOODWORKING YOUR ATTENTION

**"The poor guy who's just had a spat with a family member and goes down into the basement to work in his shop is apt to do something the wrong way."**

*Jim Elmore, product safety manager, Stanley Tools*

"When you're emotionally upset, let the tools lie. If you're overtired or feeling ill, don't try to work. These are commonsense things that people overlook sometimes for the sake of getting the project done," notes Elmore.

"Inattentiveness and distractions can lead to disaster," agrees the NSC's Schmidt. "Concentrate on the task at hand and don't rush through it, even when you feel hurried."

To break up the monotony of making repetitive cuts, stop and do something else for awhile. Also, insist that no visitors disrupt you. In particular, keep small children out of your shop at all times, especially while you're busy working.

The NSC insists that you stay out of the shop when you're under the influence of alcohol or any medication that affects your alertness or ability to function normally. And, smoking while using tools isn't recommended either. Distractions, such as smoke in your eyes or dropping a cigarette, at a critical time, could result in injury.

**Recommended reading—great references for shop safety:**

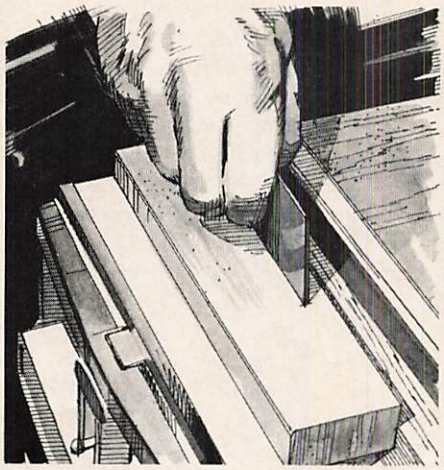
- *Guide to Hand Tools: Selection, Safety Tips, Proper Use and Care*, 90 pages, $3, *Hand Tool Reference Chart No. 207*, $1.25, Hand Tools Institute, 25 N. Broadway, Tarrytown, NY 10591; 914/332-0040.
- *Safety Is Specific*, 24 pages, $1.60, Power Tool Institute, Inc., 501 W.Algonquin Rd., Arlington Heights, IL 60005; 312/593-8350.
- *Woodworking Safety*, 12 pages, 46 cents, Nat'l. Safety Council, 444 N. Michigan Ave., Chicago,IL 60611; 312/527-4800.

Written by George Brandsberg  Illustrations: Jim Stevenson

# PUT A RAZOR-SHARP EDGE ON YOUR HAND SCRAPER

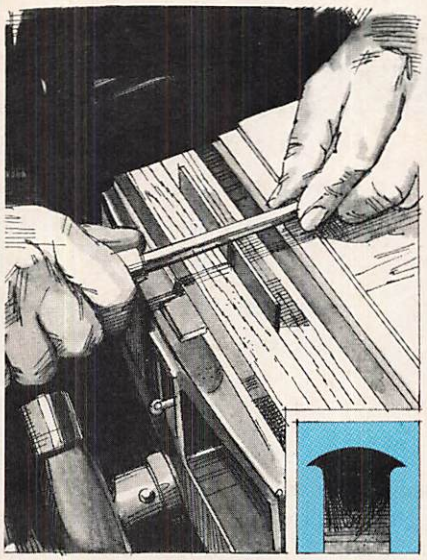
**Craftsmen have long turned to the hand scraper to remove stock quickly while leaving an extra-smooth surface. A scraper can do wonders for you, too, if you sharpen it correctly. Here's how:**

**1** Whether you're sharpening a new scraper, or reviving a dull one, start by securing the scraper in a vise. File the scraper edge flat and square by stroking it 4–6 times with a metal-cutting file.

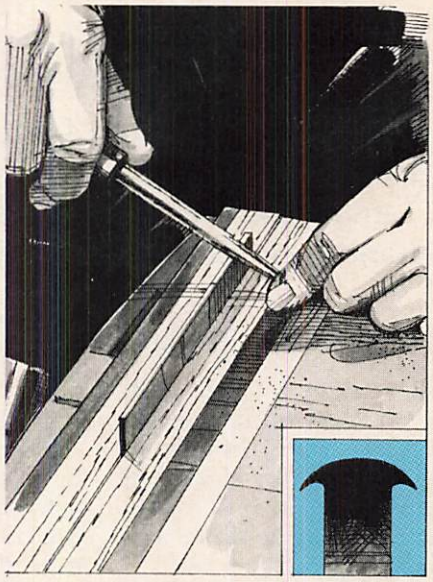


**2** To smooth the edge, hold the scraper upright as shown, and pull it across a sharpening stone 4–6 times.

**3** To remove the microscopic metal burrs that filing and smoothing create, lay the scraper flat, and draw it across the stone 4–6 times. Flip the scraper over and repeat. At this point, the edge should be smooth and square, as shown in the inset illustration. Return the scraper to the vise.



**4** With a round-shanked screwdriver, or a special burnisher tool, held perpendicular to the clamped scraper's edge, firmly stroke the length of the scraper 2–3 times to begin forming the *burr* (the edge that actually does the cutting).



**5** Next, with the burnisher tool at a slight angle, stroke the scraper's edges 2–3 more times. This increases the "hook angle" of the burr.

**6** Repeat steps 1 through 5 for the edges of the scraper opposite those just sharpened. This time, however, hold the scraper in your hand. Clamping the scraper in a vise will dull the already-sharpened edges.

Illustrations: Jim Stevenson

WOOD® Magazine's 1988

# HOLIDAY GIFT SHOWCASE

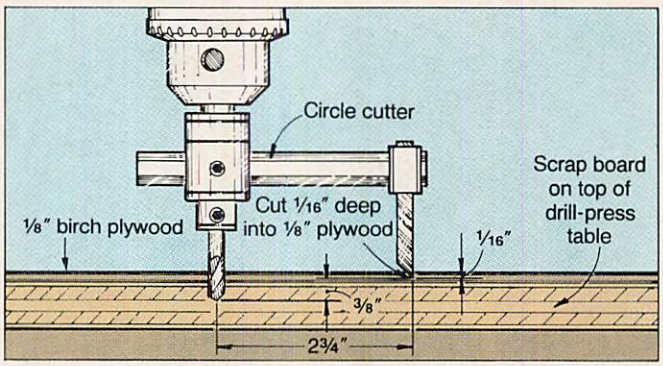
Ties, perfume, and plastic toys certainly have their place at the holidays, but we think you'll agree they just don't compare to something that's homemade. Here's hoping that you find a project in our 17-page gift section to tickle the fancy of those special people on your gift list. Happy holidays from your friends at WOOD. magazine!

# SCROLL-SAWED SEASONAL

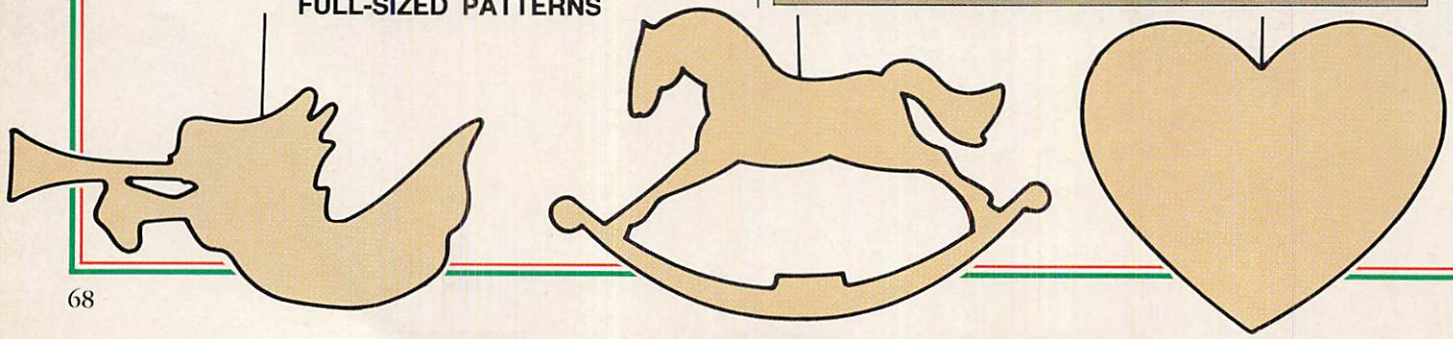
**Spruce up your Christmas tree this year with these delightfully dainty decorations. You can turn out a treeful in an evening or two with just a little help from your scroll saw and a drill press. While you're at it, cut out a few for your friends and relatives; they'll be glad you did. (For our source of thin stock required for this project, see the Buying Guide on page 70.)**

**CUTTING THE RINGS**

1 With a compass, mark a 2¾"-diameter circle on ⅛"-thick plywood for each ring required. Reset the compass for a 3"-diameter circle. Now, using the same center point, mark a larger circle outside each smaller one.

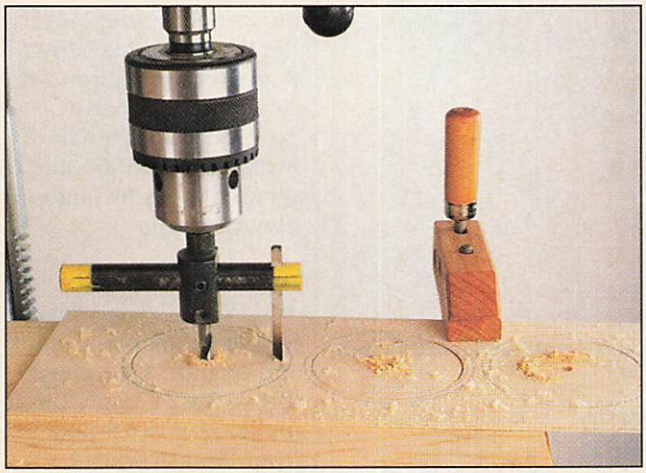



**FULL-SIZED PATTERNS**



HOLIDAY ORNAMENTS

# SILHOUETTES



**Use a circle cutter chucked into your drill press to cut the inside of each plywood ring to shape.**

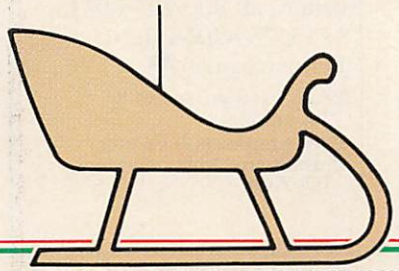
**2** Chuck a circle cutter into your drill press. Position the cutter where shown on the drawing (*far left*). As shown in the photo at *left*, clamp the plywood to the drill table, and position the circle-cutter bit directly over the center point used to mark the circles. Start the drill (we used a speed of about 250 rpm) and cut halfway through the plywood.

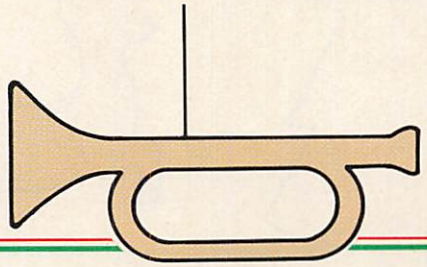
**3** Flip the plywood over, center the bit over the hole just drilled, and finish cutting through the plywood to form the inside of the ring. The two-step procedure minimizes chip-out.

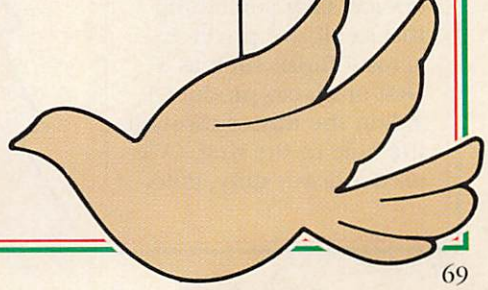
**4** Cut the outside of each ring to shape on a band saw or scroll saw, cutting just outside the marked line. Hand-sand to the line for finished shape (we used a sanding block with 150-grit paper).

**5** Cut two pieces of ¾" plywood to 5×7", and construct the drilling jig shown on the next page.

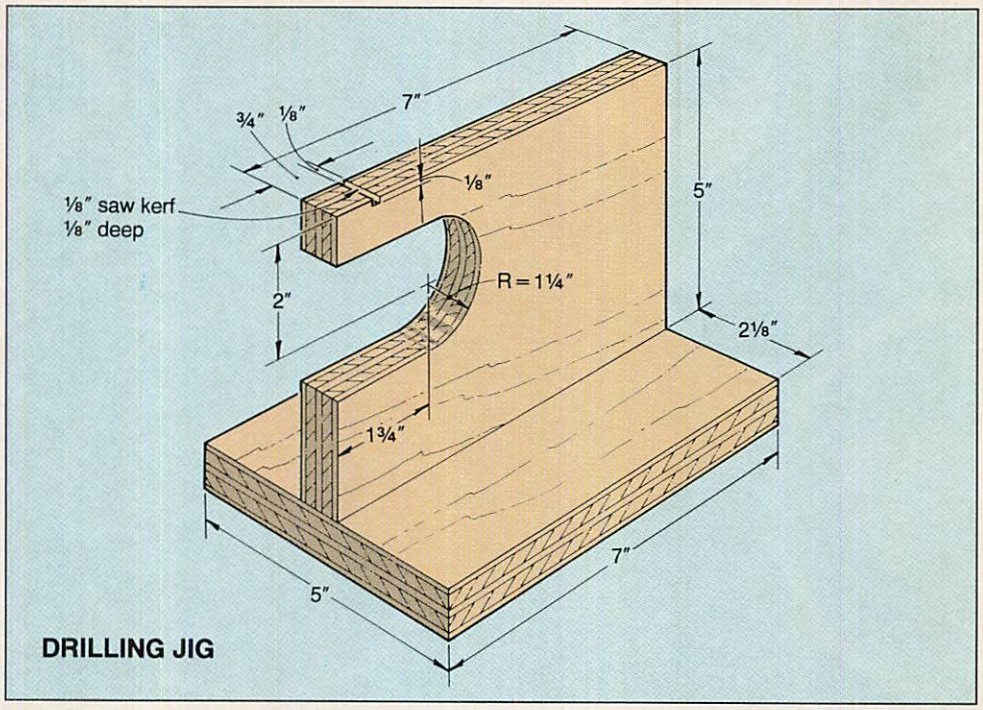
*Continued*







**6** Clip the head off a 4d finish nail, and chuck the nail into the drill press. Start the drill, and sand or file the bottom ⅜″ of the nail to 1/16″ diameter. Most 1/16″ bits are too small for a drill-press chuck. (We attached 60-grit sandpaper to a sanding block to shape the end of the nail.) Place a ring in the kerf in the jig, center the ring under the bit, and drill a 1/16″ thread-access hole through each ring as shown in the photo *below right.*



DRILLING JIG

### SHAPING THE HOLIDAY FIGURES

**1** Using carbon paper, trace the full-sized ornament patterns onto paper. Adhere the patterns to the ⅛″ stock with spray adhesive.

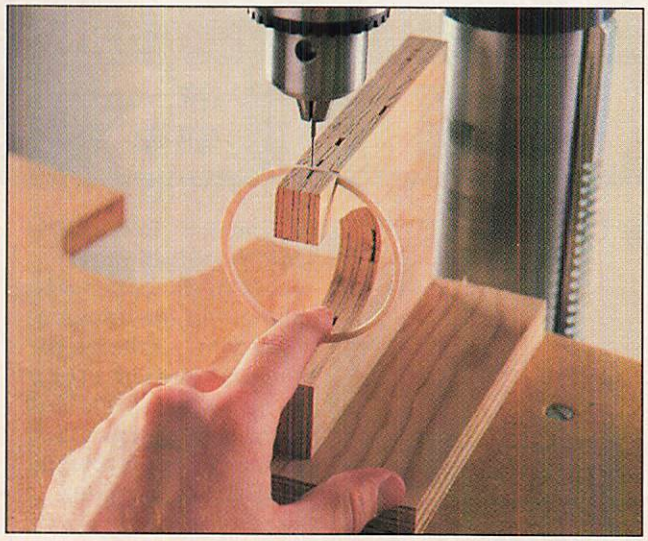
**2** Scroll-saw the figures to shape, and remove the patterns. If you have trouble removing the paper patterns, moisten them with thinner, and they'll peel right off. Lightly sand each figure with 220-grit sandpaper.

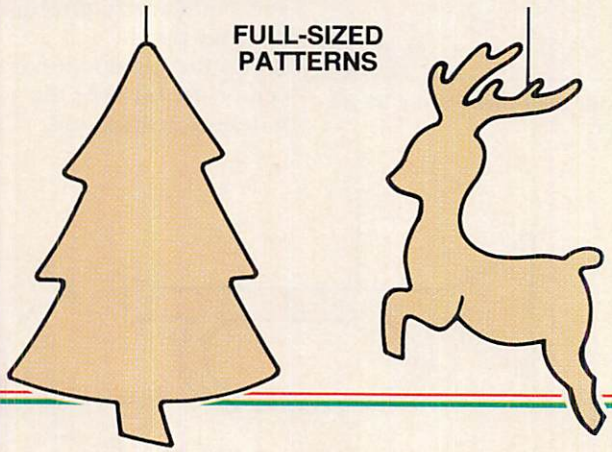
**3** With the 4d finish nail still chucked into your drill press, hold a wood figure upright in a handscrew clamp, and drill a ⅛″-deep hole. Later, you'll insert thread into the hole for hanging. See the full-sized patterns for hole locations.

### FINAL ASSEMBLY

**1** Apply the finish of your choice. (For something this small, we prefer an aerosol finish such as a Deft or Flecto product.)

**2** Run the thread through the hole in the ring. (We used a heavy-duty, gold-colored cotton thread.) Place a dab of instant glue (cyanoacrylate) on the end of the thread inside the ring, and insert the thread into the hole in the top of the hardwood figure. Move the thread up and down to center the figure in the ring. Once properly positioned, put a dab of instant glue on the thread where it goes through the plywood ring.


**With a sharpened 4d finish nail and a drilling jig, drill a hole through each birch plywood ring.**




### BUYING GUIDE

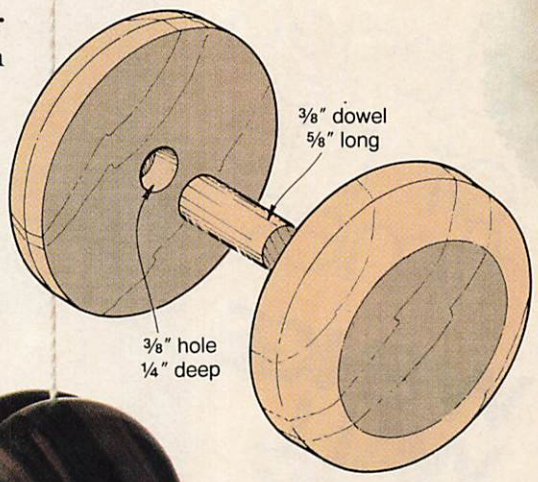
- **⅛″ stock.** One square foot of ⅛″ maple, padauk, and walnut. Two pieces of ⅛×6×24″ 3-ply birch plywood. $18.75 ppd. from Woodworker's Dream, P.O. Box 329, Nazareth, PA 18064; to order call 800-247-6931 (215/759-2064 in Pennsylvania).

Project Design: James R. Downing
Photographs: Bob Calmer
Illustrations: Kim Downing; Bill Zaun

# A NIFTY PROJECT WITH ONLY ONE STRING ATTACHED

# SCRAPWOOD YO-YO

**Dollar for dollar, it's hard to beat the enjoyment kids—or adults—get from playing with yo-yos. You'll have fun making this terrific stocking stuffer, too.**



## FIRST, CONSTRUCT THE JIG

**1** Mark a 3"-diameter circle and a 1½"-diameter circle on a piece of ¾"-thick scrap stock. Band-saw the discs to shape.
**2** Glue and clamp the smaller disc to the center of the larger disc (locating it exactly on center isn't critical).
**3** Fasten the 3" disc to a 3" faceplate and thread onto the headstock spindle. Slide the tailstock against the smaller disc to make a slight indention at the disc's center. Back the tailstock away, and drill a ⅜" hole ⅜" deep at the center point.
**4** Glue a ⅜" dowel ⅝" long into the hole you just drilled.

## NOW, TURN THE YO-YO PARTS

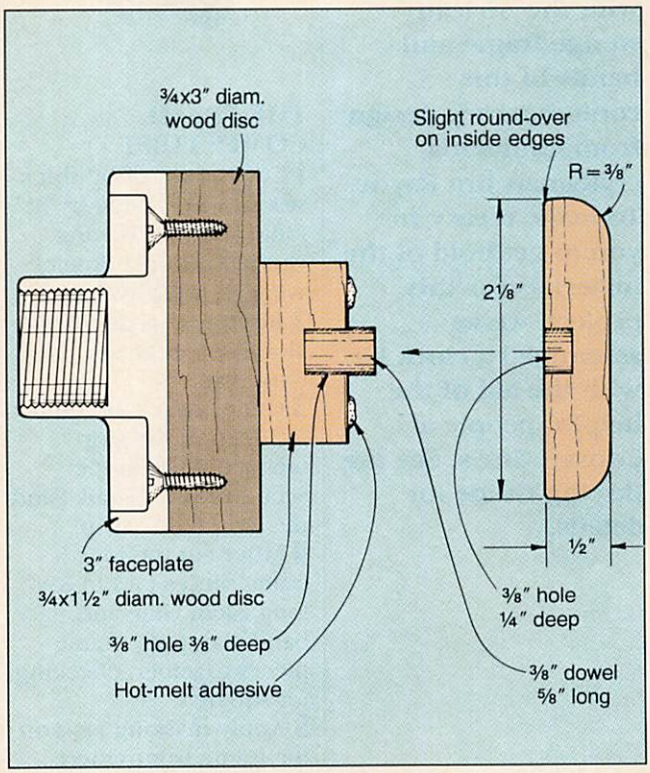
**1** Mark a pair of 2½"-diameter circles on a piece of highly figured scrap stock. Band-saw the discs to shape.
**2** Drill a ⅜" hole ¼" deep at the center point of each disc.
**3** Using hot-melt adhesive, glue one of the yo-yo halves flat against the 1½"-diameter jig disc.
**4** Turn the yo-yo half to a 2⅛" diameter, and then turn the piece to ½" thick. Next, turn a ⅜" radius on the outside corners (we used a small gouge). Check the radius with a ⅜" round-over bit as shown in the photo *below*. Sand a slight round-over on the inside edge. Finsh-sand the yo-yo half. Using a 1" chisel and a mallet, gently tap between the yo-yo half and 1½"-diameter disc to separate the two parts. Pry at several different spots for an easy release.

**Check the turned radius with a ⅜" round-over bit.**

**5** Scrape the hot-melt adhesive off the jig, and sand the inside face of the yo-yo half. Repeat the procedure to turn the other half. Hold the two halves together and check the shapes. You want the two halves identical in profile and size for a true-spinning yo-yo. Remount and turn one half if necessary.
**6** Cut a piece of ⅜" dowel to ⅝" long, and glue the two halves together. Apply the finish.
**7** Order the yo-yo strings and trick book from the source listed in the Buying Guide.

## BUYING GUIDE

• **Strings and book.** Ten yo-yo strings and a yo-yo trick book for $2 ppd. from Duncan Trick Book Offer, P.O. Box 165, Baraboo, WI 53913.




Project Design: Marlen Kemmet  Photographs: Hopkins Associates  Illustrations: Kim Downing; Bill Zaun

design of the times

# WENGE WALL CLOCK

**The bird's-eye maple face contrasts nicely with the African wenge frame and hands in this contemporary design from California craftsman Jim Payne. To make it easy for you to get hold of the materials for this project, we've assembled a clock kit with the aid of the helpful people at Constantine's. See the Buying Guide for details.**

## THE FRAME COMES FIRST

**1** Cut a piece of ¾"-thick stock to 1½" wide by 38" long. (See the Buying Guide for our source of wenge, or use walnut.)

**2** Rout a ¼" round-over along one edge of the long strip.

**3** Cut or rout a ⅜" rabbet ⅞" deep in the strip where shown in the Section View Detail. Sand the long frame strip.

**4** Miter-cut the four frame pieces (A) to 8½" long each. Glue and band-clamp the frame pieces together, checking for square.

**5** Apply masking tape on the frame front where shown in photo A. The tape is easy to mark on and minimizes chip-out when cutting the kerfs. Mark the ⅛"-wide kerf locations, and cut ⅛" kerfs ⅛" deep between the kerf lines. (We used a radial arm saw, but you could place the frame facedown and cut the kerfs on a table saw.)

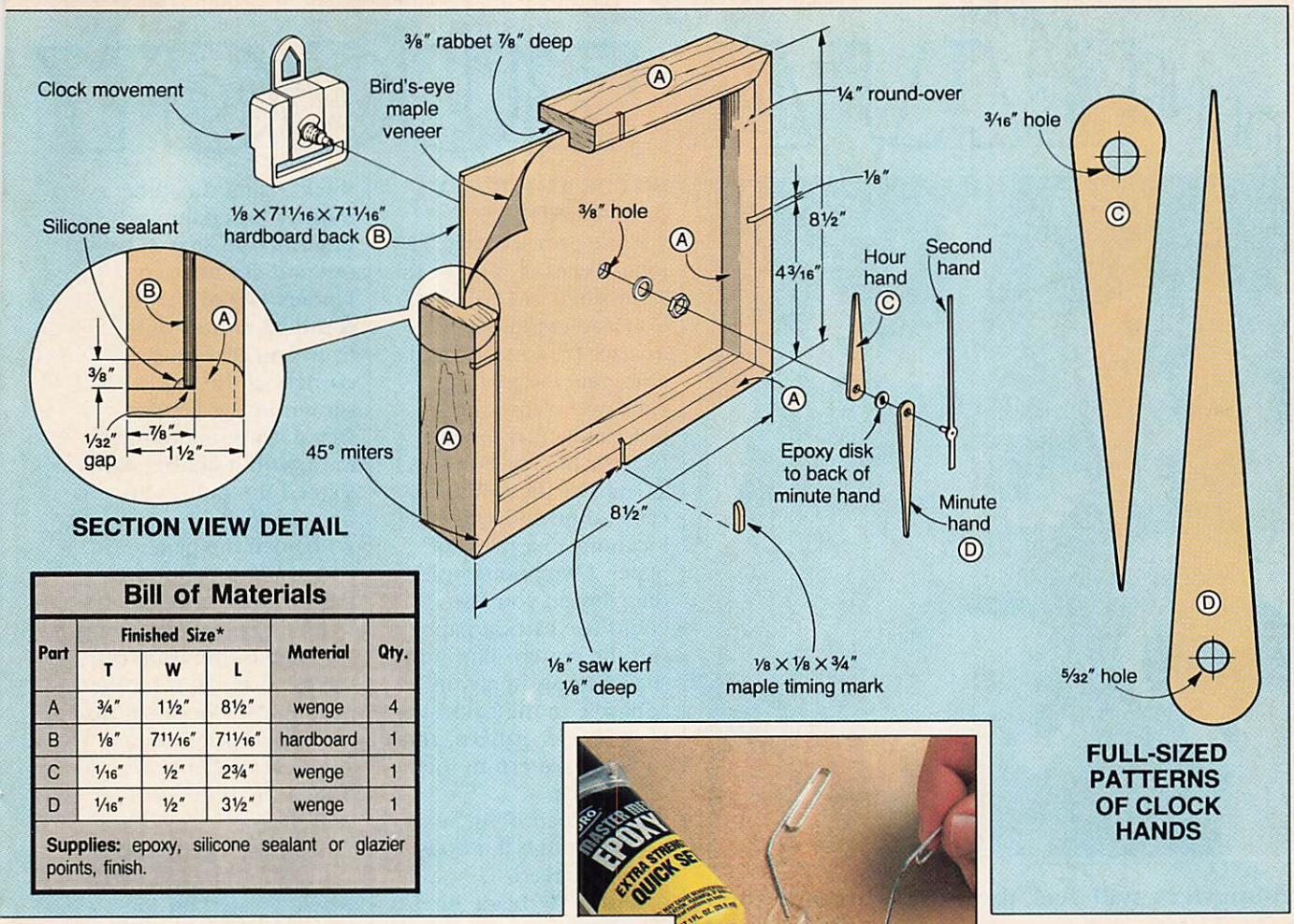
**6** Rip a ⅛"-thick strip of maple from the edge of a ½"- or ¾"-thick board. With a handsaw or scroll saw, cut a strip 3⁄16" wide from the strip for the timing marks. (We'll narrow the 3⁄16" width to ⅛" when we sand them flush with the frame.) Cut the hour marks to 13⁄16" long, glue them in the kerfs, and sand them flush after the glue dries.

## VENEER THE FACE

**1** Cut a piece of hardboard (B) to fit the rabbeted opening in the frame (we cut ours 1⁄16" undersize to allow for movement of the frame).

**2** Place the hardboard on the section of the veneer with the nicest figure (see the Buying Guide for our source of veneer). Use a utility knife to cut the veneer (see photo B). Peel off the backing sheet, and stick the veneer to the hardboard, with the edges flush.

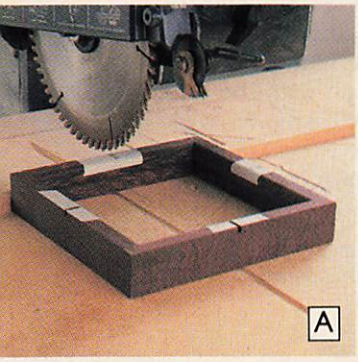
**3** Locate and drill a ⅜" hole in the center of the veneer face. (If you use a clock other than the one listed in the Buying Guide, measure the shaft diameter before drilling the hole.)



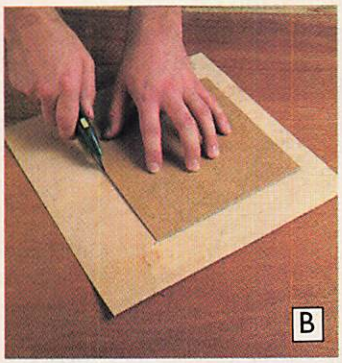

**Bill of Materials**

| Part | Finished Size* | | | Material | Qty. |
|---|---|---|---|---|---|
| | T | W | L | | |
| A | 3/4" | 1 1/2" | 8 1/2" | wenge | 4 |
| B | 1/8" | 7 11/16" | 7 11/16" | hardboard | 1 |
| C | 1/16" | 1/2" | 2 3/4" | wenge | 1 |
| D | 1/16" | 1/2" | 3 1/2" | wenge | 1 |

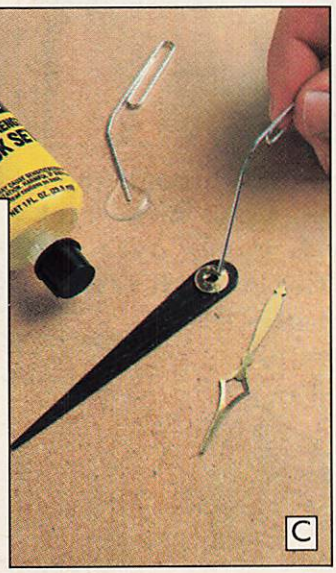
**Supplies:** epoxy, silicone sealant or glazier points, finish.




**Mark the hour mark locations and cut the kerfs.**




**Position the hardboard and cut the veneer face with a knife.**




**Epoxy the metal disk to the back of the minute hand.**

## FORM THE HANDS

**1** Rip a 1/8"-thick piece of wenge 12" long from the edge of a 3/4"-thick board. Using carbon paper, transfer the hand patterns and hole center points onto the thin strip.

**2** Using a band saw or scroll saw, cut the hands to shape. Drill a 3/16" hole in the hour hand and a 5/32" hole in the minute hand. Sand the hands to 1/16" thick.

**3** With scissors or tin snips, cut the shaft end off the minute hand supplied with the clock (all you need is the end with the hole). As shown in photo C, epoxy the disk, centered over the 5/32" hole, to the back face of the minute hand.

## THE END IS NEAR

**1** Apply the finish to the clock frame, hands, and veneered face. Later, use silicone sealant to hold the face in the frame (see the Section View Detail).

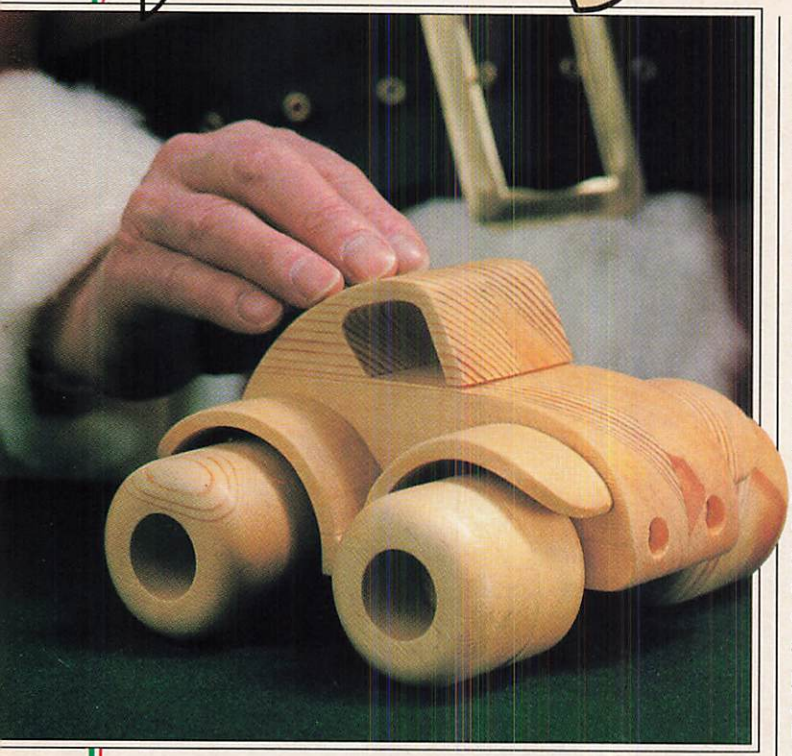
**2** Fasten the clock movement to the veneered face, and slip the clock hands onto the movement's shaft. Add a battery, hang, and be ready to cheerfully give anyone the time of day.

## BUYING GUIDE

**• Wenge clock kit.** 12 × 12" bird's-eye maple peel-and-stick veneer, 3/4 × 3 × 48" wenge, mini-quartz clock movement. Order wenge clock kit, catalog no. WD1188 for $25.95 ppd. from Constantine's, 2050 Eastchester Rd., Bronx, NY 10461.

Project Design: Jim Payne
Photographs: Hopkins Associates
Illustrations: Kim Downing; Mike Henry

# DUNE JUMPIN' BAJA BUGGY



**Youngsters will feel the wind through their hair and the summer sun upon their faces when driving this beach buggy over the dunes of make-believe. This fat-tired toy requires just a few feet of 2×4 stock and about 2½ hours to build. Can you think of an easier child pleaser?**

## SHAPE THE BODY AND FENDERS

**1** Plane or resaw two 12"-long pieces of pine or fir 2×4 stock to 1 1/16" thick. You also could use five-quarter (5/4) stock and eliminate the planing. Glue and clamp the pieces together face to face for the car body (A).

**2** Transfer the full-sized car outline and axle-hole locations to a piece of paper. (We photocopied the pattern; you also could use carbon paper.) Cut the pattern outline to shape. Apply spray-on adhesive to the back side of the paper pattern, and stick the pattern to the pine block.

**3** Drill a pair of 7/16" axle holes through the body where marked.

**4** With a ⅛" blade on your band saw, cut the car body and window opening to shape.

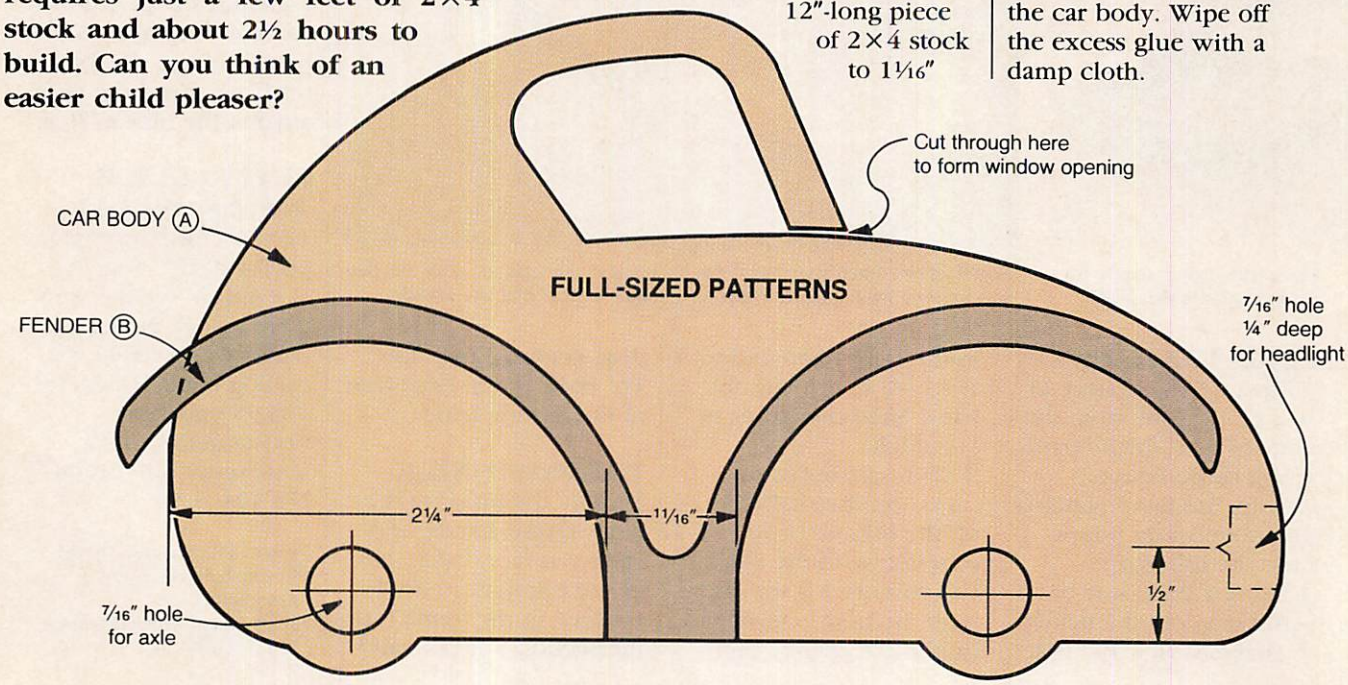
**5** Plane or resaw another 12"-long piece of 2×4 stock to 1 1/16" thick. Using the same transfer procedure described in step 2, lay out and cut the two fenders (B) to shape.

**6** Sand a radius on the front and rear outside corners of the fenders as shown in the Fender Detail. (We marked the radii with a quarter, and shaped the radii with a belt sander.)

**7** Remove the paper pattern, and hand-sand the car body and fenders.

**8** Drill a pair of 7/16" holes ¼" deep in the front of the car body to form the headlights. (We held the car body upright in a handscrew clamp, and drilled the holes on the drill press.)

**9** Glue and clamp the fenders to the car body where located on the Full-Sized Pattern. The bottom middle section of the fenders should be flush with the bottom of the car body. Wipe off the excess glue with a damp cloth.



## LET'S ADD THE WHEELS

**1** Plane two 12″ lengths of 2×4 stock to 1 1/16″. Laminate the two pieces together face to face. Allow the glue to dry.

**2** Using a compass, mark four 2 1/8″-diameter (1 1/16″ radius) circles on the top face of the laminated stock for the wheels (C).

**3** Chuck a 1″ Forstner or paddle bit into your drill press. Drill a 1 1/16″-deep hole at the center of each marked wheel. Switch to a brad-point bit, and drill a 3/8″ hole through the center of each wheel.

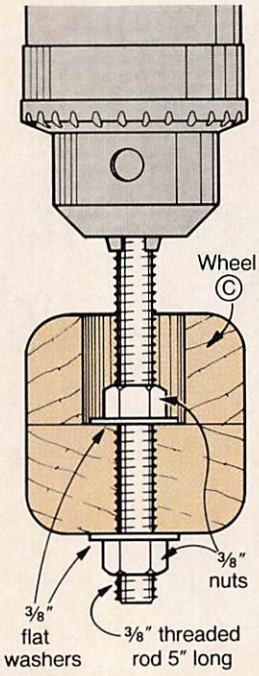
**4** Using a band saw, cut the four wheels to shape, cutting just outside the marked outline.

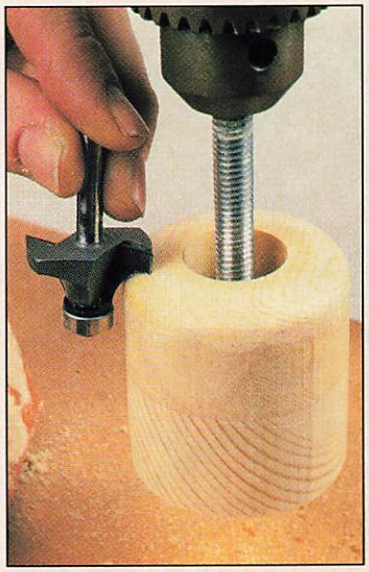
**5** Fasten a wheel to a 5″-long piece of 3/8″-threaded rod where shown on the drawing at *right*. Chuck the assembly into your drill press. With 80-grit sandpaper, sand the wheels smooth (we used a sanding block). Sand a 3/8″ round-over along the outside edges. With the drill press stopped, check the sanded round-overs for uniformity with a 3/8″ round-over bit as shown at *right*. Finish-sand with finer grits of paper. Repeat the process for the remaining wheels.

**6** From 3/8″ dowel stock, cut two axles 4 3/8″ long each. Glue one axle, flush with inside edge of the 1″ hole, to each wheel. (See the Exploded-View Drawing for reference.) Insert the axles through the car body, and glue on the other two wheels so the wheel-axle assemblies rotate easily.

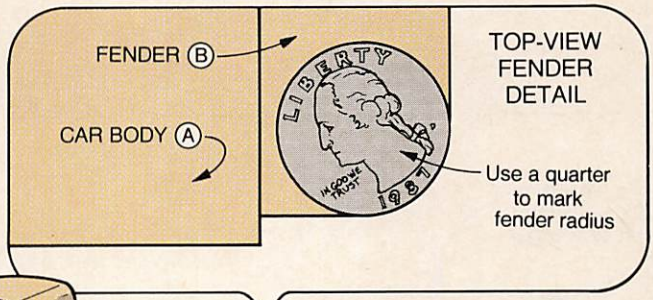
## APPLY THE FINISH AND HEAD FOR THE DUNES

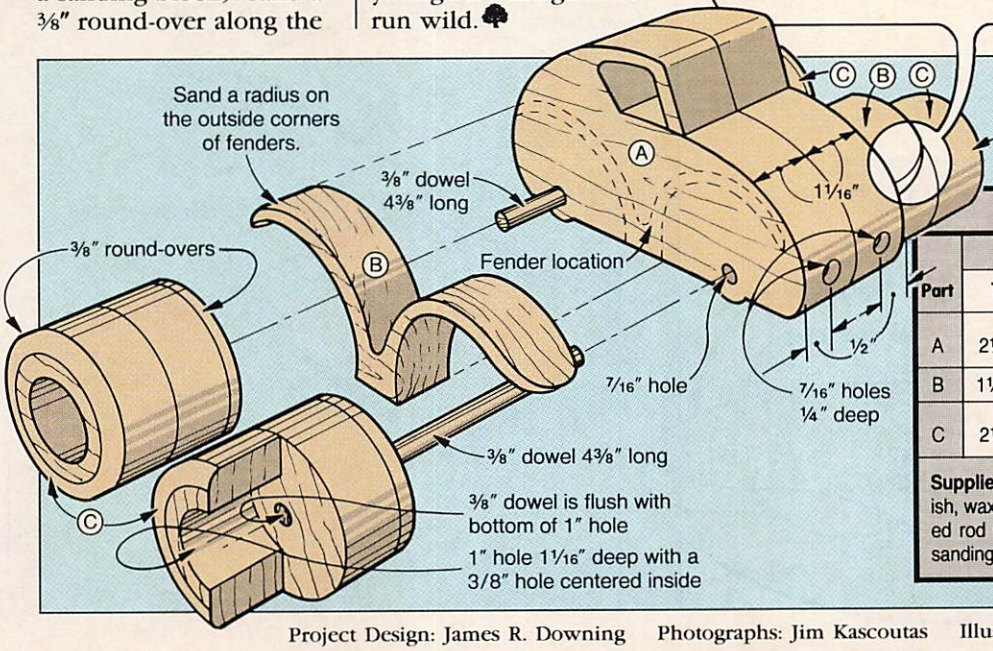
**1** Apply two coats of clear finish. (We found that an oil finish tends to pick up too much dirt over time, but, paint, lacquer, or polyurethane work well.) Now, watch a deserving youngster's imagination run wild.



**When sanding the band-sawed wheels to shape on the drill press, check round-overs with a 3/8″ round-over bit for uniformity.**




### Bill of Materials

| Part | Finished Size T | Finished Size W | Finished Size L | Material | Qty. |
|---|---|---|---|---|---|
| A | 2 1/8″ | 3 1/2″ | 5 3/4″ | pine (laminated) | 1 |
| B | 1 1/16″ | 1 3/4″ | 5 3/4″ | pine | 2 |
| C | 2 1/8″ | 2 1/8″ diam. | | pine (laminated) | 4 |

**Supplies:** 3/8″ dowel stock, spray adhesive, finish, wax, 0000 steel wool, 3/8×5″—long threaded rod with two 3/8″ nuts and flat washers for sanding arbor.

Project Design: James R. Downing  Photographs: Jim Kascoutas  Illustrations: Kim Downing; Mike Henry

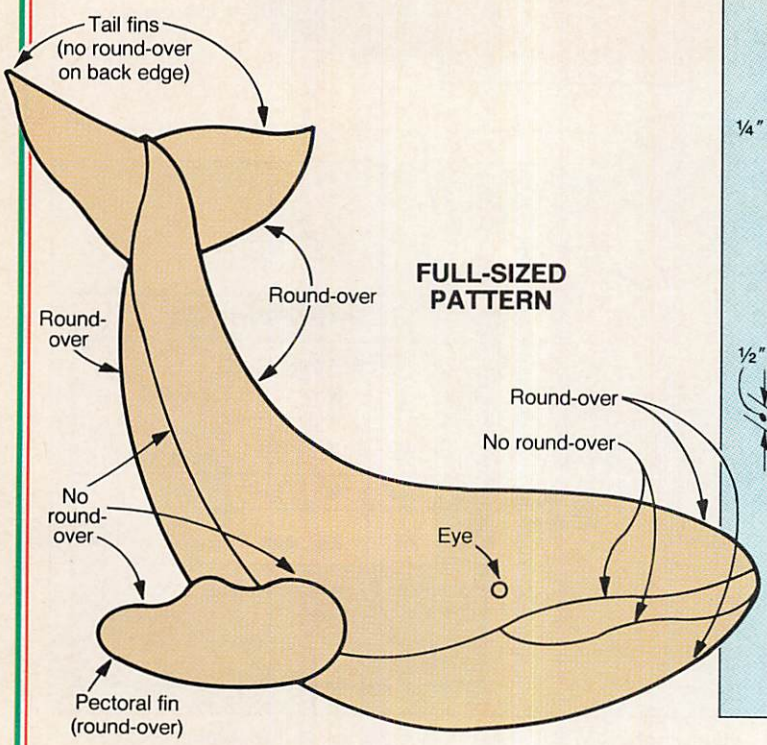
# ONE

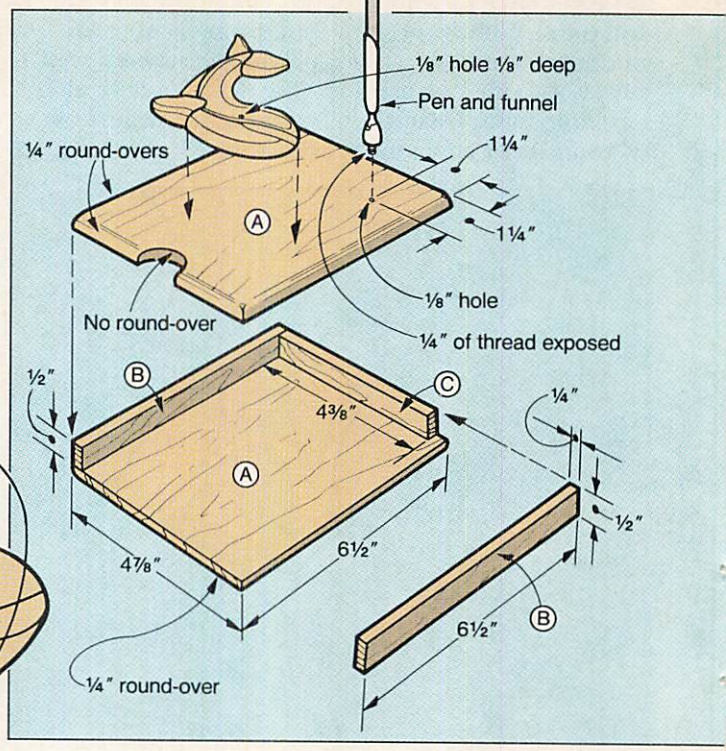
## START WITH THE NOTEPAD BOX

***Note:** You'll need thin stock for this project. You can either resaw or plane thicker stock to ¼" thick.*

**1** To form the box top and bottom (A), cut a piece of ¼" oak to 4⅞" wide by 14" long. (We planed down a ½"-thick oak board.) Draw a perpendicular line across the board 6½" from one end; then mark the center of the line. Bore a 1" hole at the centerpoint.

**2** Cut the ¼" board in two as shown in the photo *far right*. (We set a stop 6½" from the inside edge of the saw blade when cutting the top to length.) Save the 6½"-long oak piece for the box top. From



# WHALE OF A NOTEPAD HOLDER

the remaining piece, crosscut the ¼"-thick oak box bottom to a 6½" finished length.

**3** Locate and drill the ⅛" hole for the pen funnel in the ¼"-thick oak box top.

**4** Cut a ¼"-wide by 18"-long strip from the edge of a ½"-thick oak board. Now, cut the box sides (B) and end (C) to length from the 18" strip.

**5** With the outside edges flush, glue and clamp the sides and end to the bottom piece. Later, glue and clamp the box top to the bottom assembly.

**6** Sand the box smooth. Now, with a table-mounted router and fence, rout ¼" round-overs on the top and bottom edges except at the finger notch. Finish-sand the routed box.

## FORMING THE WHALE

**1** From ¼"-thick walnut, oak, and cherry, cut three pieces 4 × 4½" long.

**2** Cover one face of the oak and one face of the walnut with double-faced tape. Now, stack the three pieces together as shown on the drawing *below.* Using carbon paper, transfer the full-sized whale pattern to a 4 × 4½" piece of paper. Adhere the pattern to the oak with spray adhesive.

**3** With a scroll saw or a band saw fitted with a ⅛" blade, cut the whale pieces to shape. Separate the pieces, and remove the tape.

**4** Epoxy together all the parts for one whale, except for the pectoral and tail fins. Sand round-overs on the whale body where shown on the Full-Sized Pattern.

**5** Tape waxed paper to a piece of plywood, and hold the whale body to the plywood with a few small nails. Then, sand a round-over on the front edge of the pectoral fin, and epoxy it to the whale body where shown in the photo *below.* Now, sand the tail fins to shape and epoxy them to the whale body. Later, finish-sand the fins to shape. (We drum-sanded the bottom side of the tail so it wouldn't lie flat on the box.) Locate and drill a ⅛" hole for the eye.

## FINAL ASSEMBLY

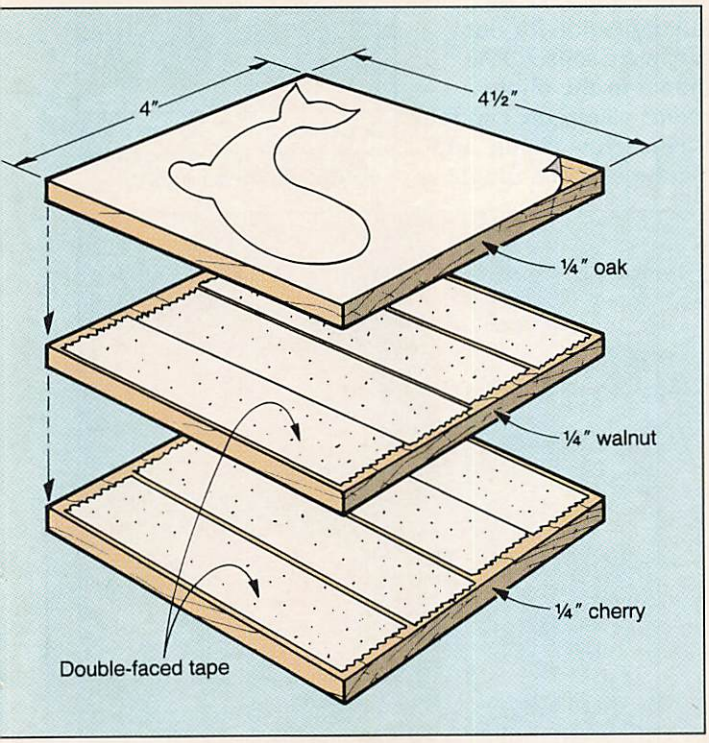
**1** Thread the mounting screw into the bottom of the pen funnel. Using a hack saw, cut the screw so only ¼" of thread protrudes from the bottom of the funnel.

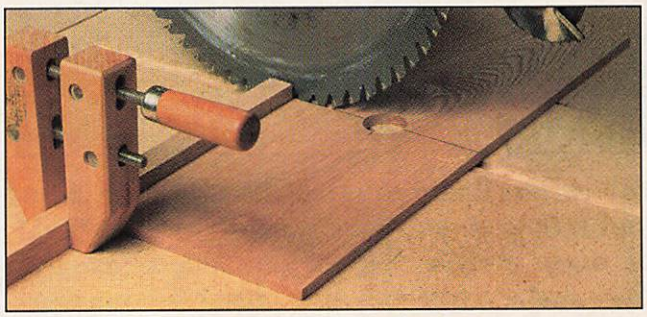
**2** Epoxy the funnel with the exposed screw thread into the hole in the box top. Now, epoxy the whale to the top of the oak box. Immediately wipe off any excess epoxy around the whale.

**3** Mask off the funnel, and apply a clear finish to the oak box and whale. (We used an aerosol finish.)

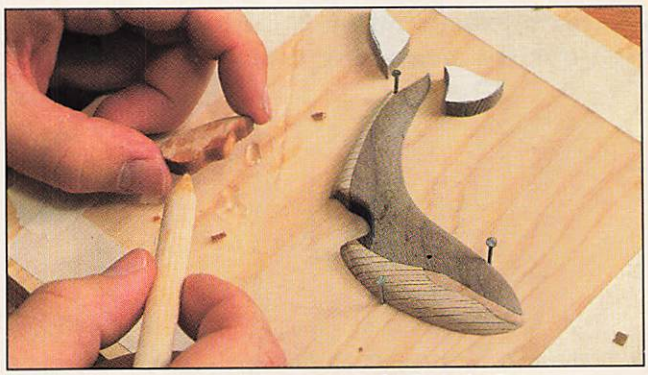
## BUYING GUIDE

• **Pen and funnel set.** Gold-colored finish, catalog no. 6521, $1.95 each, plus $2.50 postage and handling per order. Meisel Hardware Specialties, P.O. Box 70, Mound, MN 55364.



**Cut the oak piece in two to form the box top.**



**Epoxy the pectoral fin to the sanded whale body.**

Project Design: Karen and August Caryl  Photographs: Bob Calmer  Illustrations: Kim Downing; Mike Henry

# Collector's Edition DEPTH GAUGE

**You're not likely to misplace this shop heirloom. In fact, you may want to build several of these simple, yet elegant depth gauges; they make excellent gifts. Used for measuring dadoes, mortises, and other recesses where an exact reading is critical, this is one high-quality measuring tool.**

**FORM THE WALNUT BODY**

**1** Cut a piece of ¾"-thick walnut stock to 1¾ × 6" for the body.

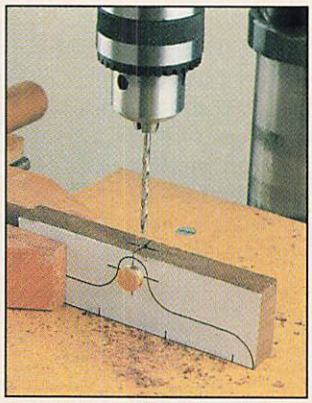
**2** Make a photocopy of the full-sized pattern. Using spray adhesive, adhere the paper pattern to the walnut. (You could transfer the pattern directly to the walnut with carbon paper.)

**3** Mark a center point on the top edge of the walnut directly above and aligned with the ⅜" hole center point. (See the photo at *right* for reference.)

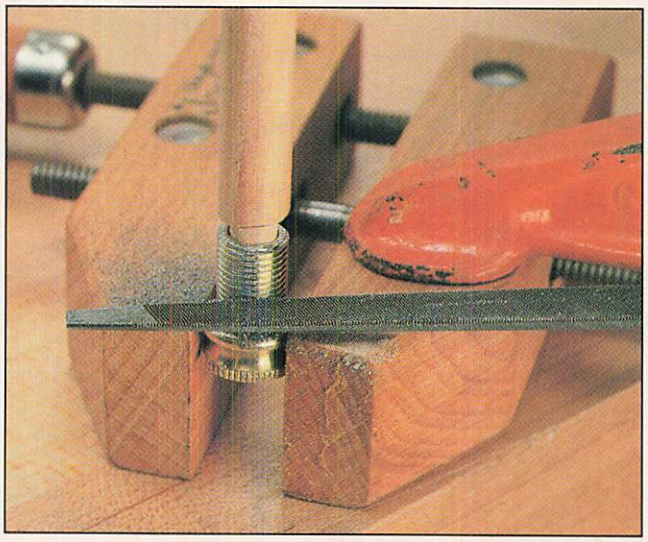
**4** Drill a ⅜" hole ⅝" deep into the face of the walnut at the marked center point.

**5** Thread the ⅜" cap onto the ⅜" nipple *as far as it will thread.* (See the Buying Guide for our hardware source.) As shown in the photo *below*, clamp the cap into a handscrew clamp, and file the exposed nipple threads. (We used a dowel to hold the nipple stationary when filing.) File the threads until the nipple slides easily into the hole in the walnut.

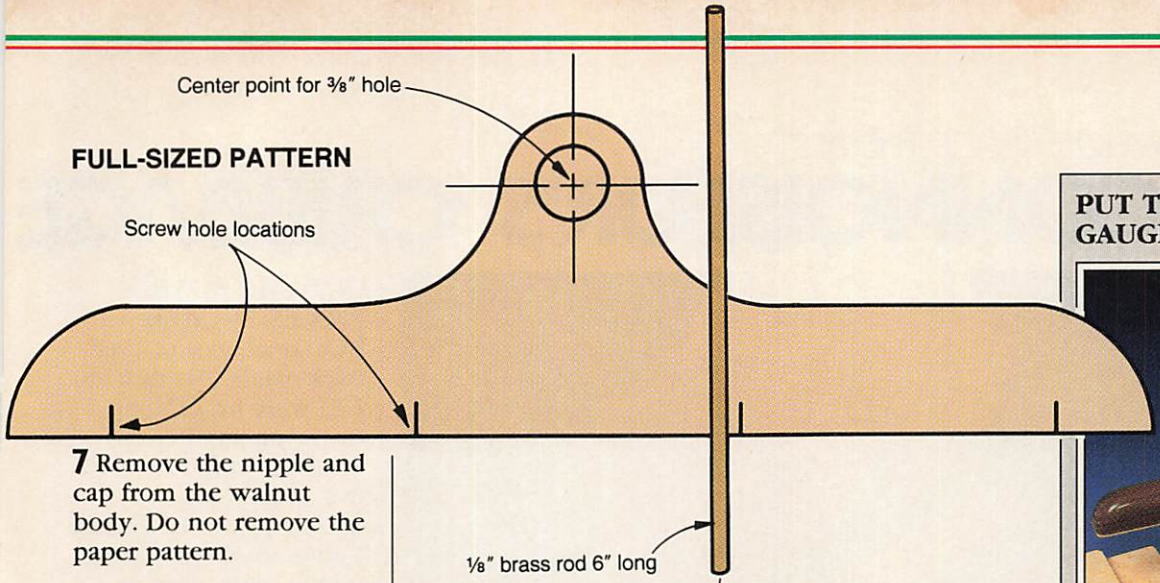
**6** Hold the nipple (cap still threaded on) with a pair of pliers, and *rotate the cap 2 turns counterclockwise.* Push the nipple and cap into the ⅜" hole in the walnut. Drill a 5/32" hole through the assembly as shown in the photo *below.*



▲ **Center a 5/32" bit over the walnut, and drill through the walnut and brass nipple.**



**Hold the cap in a small handscrew clamp, and file ▶ the nipple threads for easy insertion into the walnut body.**



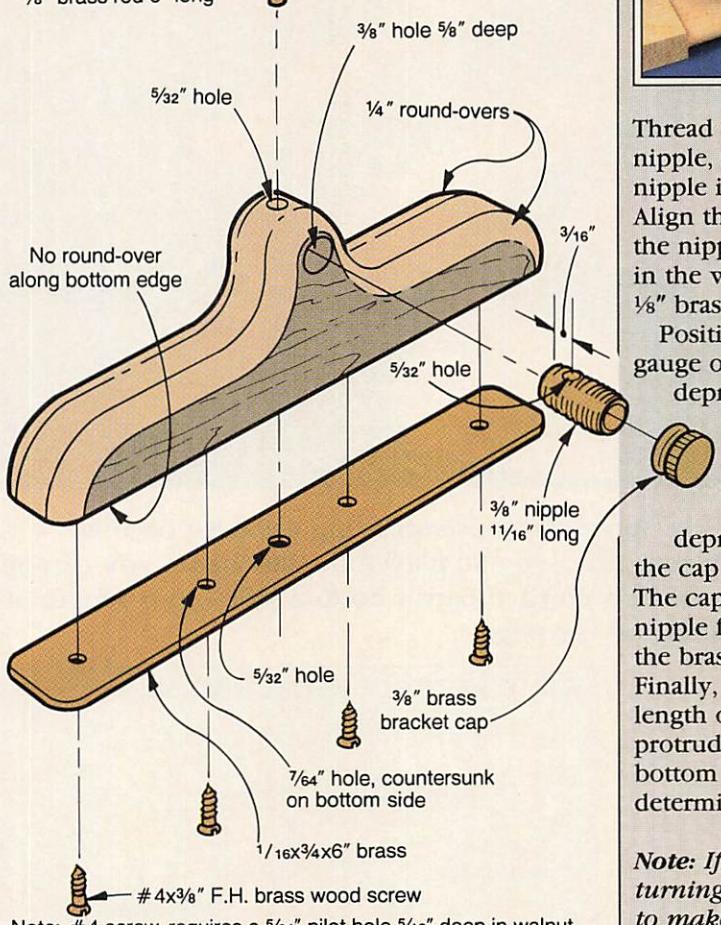

**7** Remove the nipple and cap from the walnut body. Do not remove the paper pattern.

## ADD THE BRASS BASE

**1** Crosscut a piece of 1/16 × 3/4" brass to 6" long.
**2** Use double-faced tape to adhere brass to the bottom of the body. Using the screw-hole location lines on the pattern, drill and countersink 7/64" holes through the brass. Switch bits and drill 5/64" pilot holes 5/16" deep into the walnut. (We held the walnut firmly in a handscrew clamp when drilling the holes.)

## FINAL ASSEMBLY

**1** Remove the brass strip and nipple assembly from the walnut. Band-saw the walnut body to shape, and sand the cut edges smooth. Rout a 1/4" round-over along the top edges. To keep your fingers safely away from the router bit, hold the walnut body firmly in a handscrew clamp. You'll have to stop, reposition the clamp, and continue routing. Remove the remaining paper pattern.
**2** Screw the brass strip to the bottom of the walnut. File and sand the edges of the brass strip even with the rounded-over edges of the walnut.




Note: #4 screw requires a 5/64" pilot hole 5/16" deep in walnut.

Using the previously drilled 5/32" hole in the walnut body as a guide, drill a 5/32" hole through the brass for the rod.
**3** Sand the depth gauge smooth. Mask the brass and apply the finish to the walnut. Cut a piece of 1/8" brass rod to 6" long.

## BUYING GUIDE

• **Depth gauge kit.** 3/8" brass cap, 3/8" nipple 11/16" long, 1/16 × 3/4 × 6" brass strip, 1/8" brass rod 6" long, 5—#4 × 3/8" F.H. brass wood screws. $6.50 ppd. Albright Lighting, 3029 Ingersoll Ave., Des Moines, IA 50312.

## PUT THE DEPTH GAUGE TO WORK

Thread the cap onto the nipple, and insert the nipple into the walnut. Align the 5/32" hole in the nipple with the hole in the walnut. Insert the 1/8" brass rod.

Position the depth gauge over the depression you wish to measure. Push the brass rod to the bottom of the depression. Tighten the cap on the nipple. The cap will pull the nipple forward and lock the brass rod in place. Finally, measure the length of brass rod protruding from the bottom of the gauge to determine the depth.

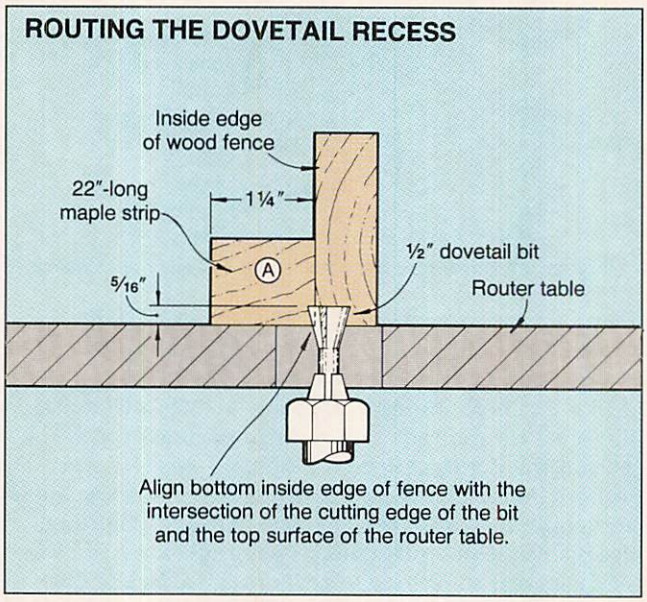
***Note:** If you do a lot of turning, you may want to make a larger version for checking the depth of bowls. To do so, increase the length of the walnut body, brass strip, and brass rod.*

Project Design: James R. Downing
Photographs: Hopkins Associates; Jim Kascoutas
Illustrations: Kim Downing; Bill Zaun

FOR PLAYERS WHO EXPECT THE BEST

# THE CONNOISEUR'S CRIBBAGE

**Even a busy guy like Santa can't resist playing cribbage on this laminated game board. After you've played the last hand, you can open the sliding door—hidden on the board's bottom side—to conveniently store a deck of cards and the pegs.**




### CUT THE BOARD PIECES TO SIZE

**1** Cut one piece of 1 1/16"-thick maple (5/4 stock) to 1¼" wide by 22" long. Later, you'll cut the maple in half to form the two streets (A).

**2** Cut a piece of ¾"-thick walnut to 2⅝ × 10" long for the center strip (B). (We used a piece of highly figured walnut.)

**3** From ½" or ¾" walnut stock, cut a piece to 2 13/16 × 12" for the sliding door (C) and the doorstop (D). Plane or resaw the piece to 5/16" thick for parts C and D.

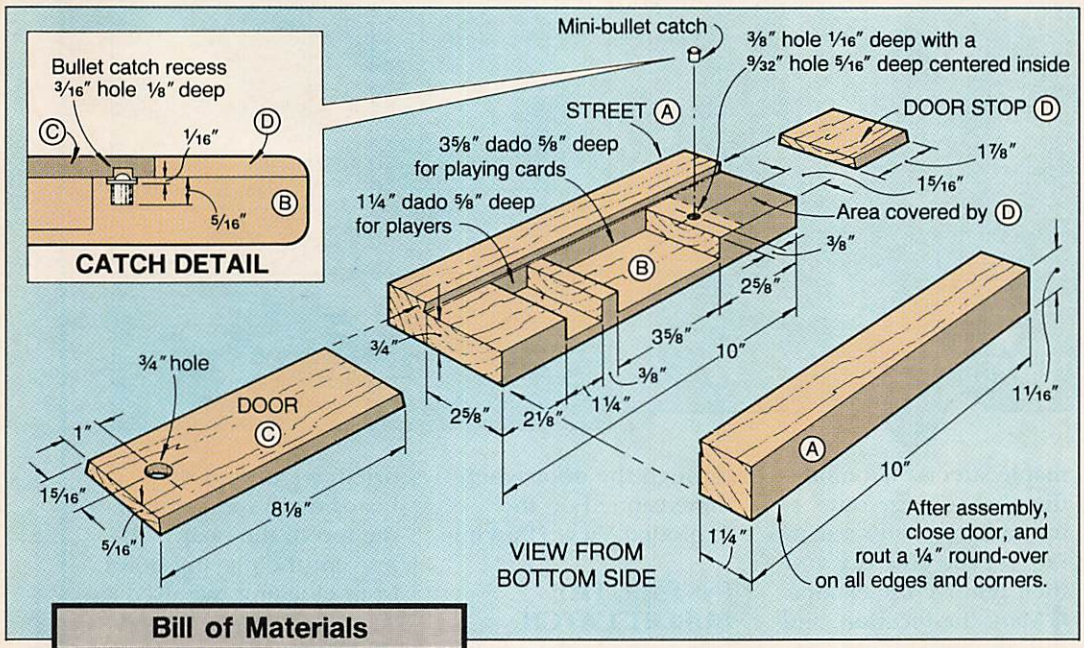
### MACHINE THE MAPLE STREETS

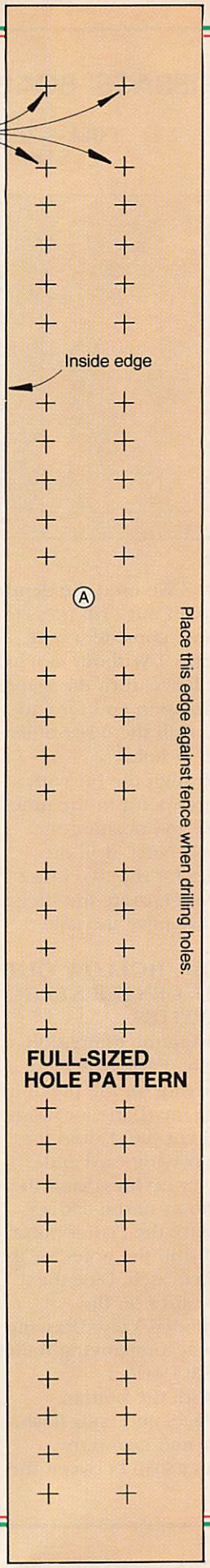
**1** Chuck a ½" dovetail bit into your table-mounted router. Position the bit and router table fence where shown on the drawing at *left*. Start the router, and rout along one edge of the 22"-long maple strip.

**2** Crosscut two 10" maple streets from the 22"-long strip. With double-faced tape, tape the two 10" strips together side by side with the routed areas facing each other. Now, cut out or make a photocopy of the full-sized Hole Pattern on the opposite page. Apply spray adhesive to the back side of the pattern, and stick it to one of the maple streets.

**3** Use a try square to mark lines through the hole center points and across the other maple street where shown on the photo at *right*.

# BOARD




## Bill of Materials

| Part | Finished Size* | | | Material | Qty. |
|---|---|---|---|---|---|
| | T | W | L | | |
| A* | 1 1/16" | 1 1/4" | 10" | maple | 2 |
| B | 3/4" | 2 5/8" | 10" | walnut | 1 |
| C* | 5/16" | 2 13/16" | 8 1/8" | walnut | 1 |
| D* | 5/16" | 2 13/16" | 1 7/8" | walnut | 1 |

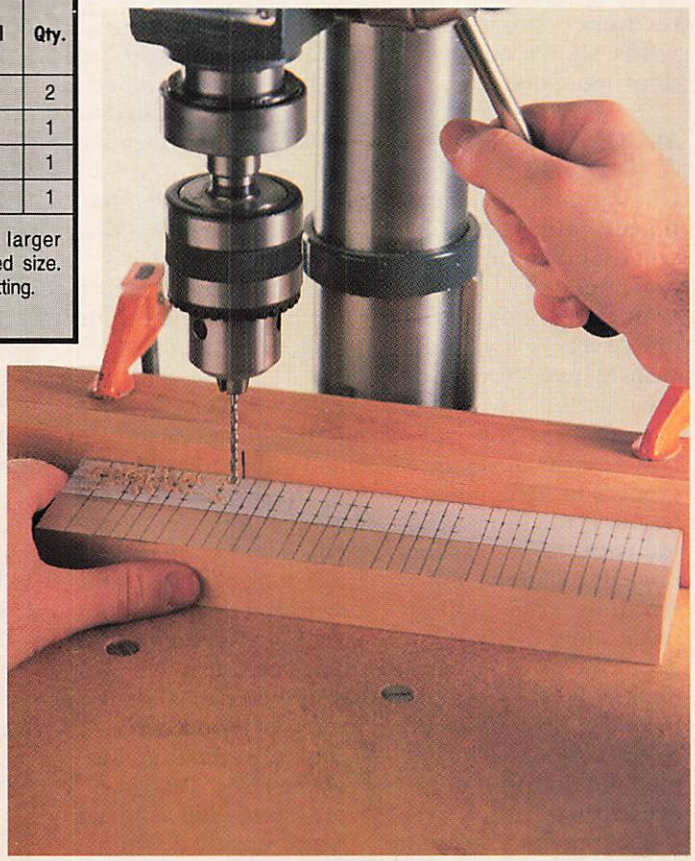
*Parts marked with an * are cut larger initially, and then trimmed to finished size. Please read the instructions before cutting.

**Supplies:** spray adhesive, finish.

**4** Chuck a 1/8" brad-point bit into the drill press. Position the center of the bit directly over one of the center points in the outer row on the pattern. As shown in the photo at *right,* clamp a fence (we used a straight board) to your drill press table so you can drill all the holes in the outer row in a straight line. Mark a line on the fence directly behind the bit where shown in the photo.

**5** Drill 1/8" holes 1/4" deep to complete the outer

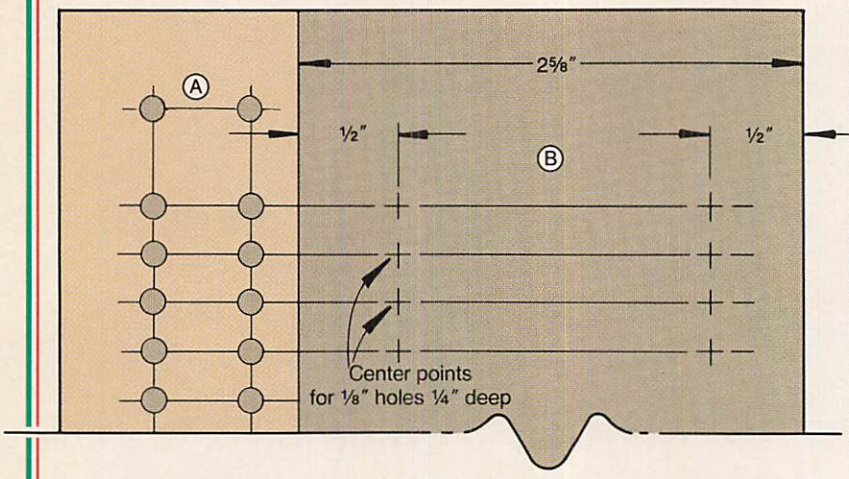
*Continued*



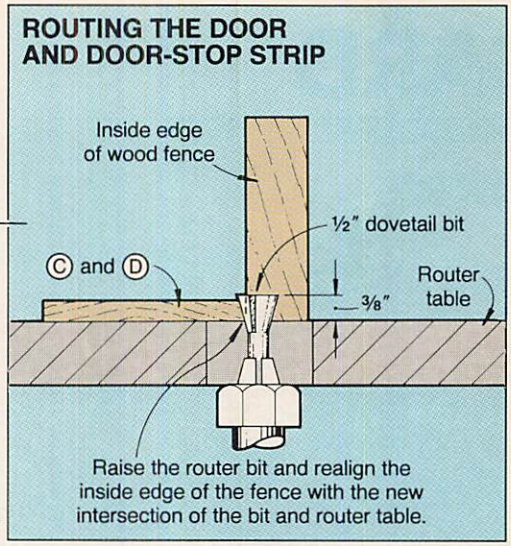
**Use the fence and marked lines to drill evenly spaced player holes in straight rows.**

# CRIBBAGE BOARD

### FULL-SIZED PATTERN OF CENTER STRIP AND SIDE STREET




### ROUTING THE DOOR AND DOOR-STOP STRIP




row. (We used the depth stop on our drill press to ensure consistent hole depths.) Without moving the fence, turn the maple lamination end for end and drill the other outer row of holes.

**6** Realign the bit with a center point in the inner row, and position the fence. Next, drill the holes for the two inner rows. Separate the streets and remove the tape.

### NOW, HOLLOW OUT THE CENTER STRIP CAVITIES

**1** Using the dimensions on the Exploded-View Drawing on the previous page, mark the locations, and cut the dadoes for the playing-card and player cavities. Sand the bottoms of the dadoes.

**2** Mark the center point, and drill the holes for the bullet catch. (See the hole sizes on the Exploded-View Drawing and accompanying Bullet Catch Detail.)

**3** With the bottom surfaces and ends flush, glue and clamp the center strip between the maple streets. Wipe off the glue squeeze-out immediately with a damp rag. Let the glue dry and then remove the clamps.

**4** Mark the location, and drill the eight holes for the game score tracks where shown on the drawing *above.*

### MAKE THE DOOR AND DOOR STOP

**1** Reposition the dovetail bit and router table fence where shown on the drawing *above right.* Rout along both edges of one of the 5/16" walnut strips where shown on the drawing. Check the fit of the test strip between the dovetail grooves in the laminated board. If the thin strip is too wide, sand or plane one edge slightly, and rerout the edge until the piece slides easily.

**2** Cut the door (C) and door stop (D) to length from the 12"-long piece.

**3** With the ends flush, glue the doorstop to the center strip.

**4** Backing the stock with scrap to prevent chip-out, drill a ¾" finger hole through the door where dimensioned on the Exploded-View Drawing.

### INSTALL THE BULLET CATCH

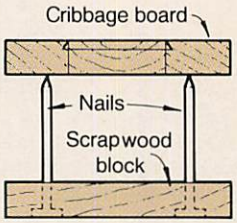
**1** Press the bullet catch into the hole in the center walnut strip.

**2** To locate the bullet catch recess in the door, slide the door open and shut several times. Remove the door, and drill a 3/16" hole ⅛" deep at the end of the indented line scribed by the bullet catch. See the Bullet Catch Detail.

### FINISHING UP

**1** Slide the door in place, and sand the cribbage board smooth. Now, rout a ¼" round-over along all edges and corners. With the door in place, sand cribbage board smooth.

**2** Apply the finish. (For an even finish, we pounded nails through a scrap of wood where shown in the drawing *above right.* Then, we positioned the cribbage board upside down on the nails and sprayed on the finish. After the finish dried, we turned the board over, and sprayed the top of the board. To prevent the playing holes from clogging, we used an aerosol finish.) Apply paraffin to the edges of the dovetailed lid for a smooth slide. Finally, read 'em and weep.




### BUYING GUIDE

• **Cribbage board kit.** 10 black-, 10 red-, and 10 natural-colored wood players, 5 mini-bullet catches (enough for 5 boards), catalog no. 7672, $5.30 per kit plus $2.50 postage. Add $5.79 for a 16-oz. can of spray adhesive. Meisel Hardware, P.O. Box 70, Mound, MN 55364.

Project Design: James R. Downing
Photographs: Bob Calmer; Hopkins Associates
Illustrations: Kim Downing; Bill Zaun

# HEIRLOOM TREE ORNAMENTS

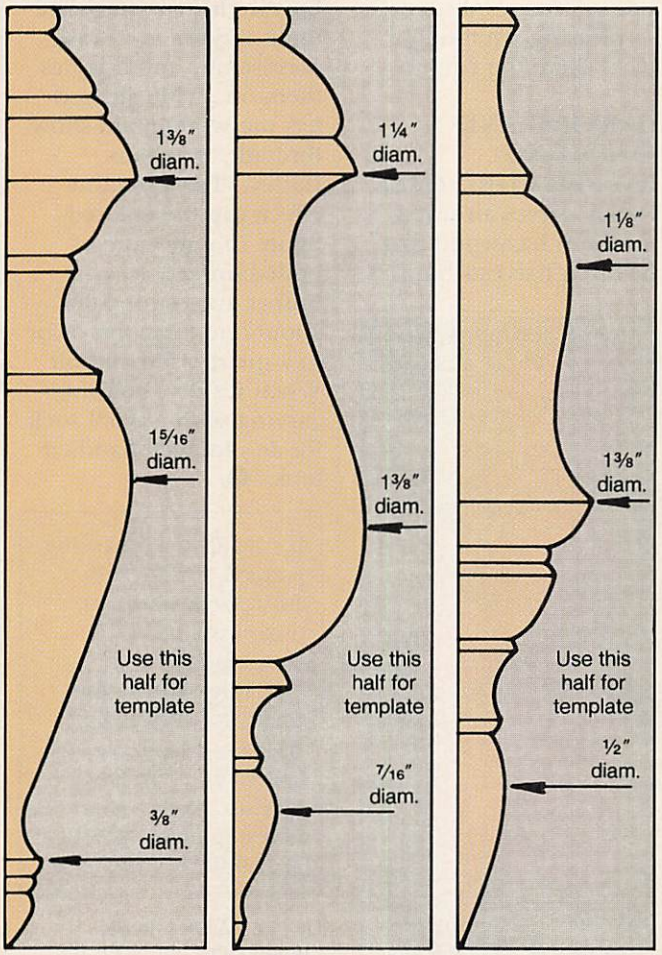
## SIMPLE TURNINGS À LA MICHAEL MODE

Michael Mode

**Another in a collection of patterns from the nation's top woodturners.**

Michael Mode's wife, Kathryn, had a simple request just before Christmas, 1983, "Why not turn a few ornaments to decorate the tree?" Being a dutiful husband, this creative Zionsville, Pennsylvania, turner went to the shop and emerged a few hours later bearing gifts like the ones shown here. Since then, Mike has turned at least 8,000 ornaments to add to his crafts-fair inventory. Here's how he turns and paints these lovely tree trimmers.

### FULL-SIZED HALF PATTERNS




### TOOLS OF THE TRADE

Mike employs four turning tools to make the ornaments: a 1" gouge to turn the blank round; a ½" gouge to refine the shape; a ⅜" fingernail gouge for the beads, coves, and hollows; and a ½" skew, for the tapers, broad convex shapes, and deep valleys.

### TURNING THE STOCK TO SHAPE

Begin with a piece of yellow poplar 1¾" square by 6" long. Find center on one end, drill a pilot hole there, and mount the stock to a screw center. To avoid hitting the center when turning, leave a small waste block next to the faceplate.

After making numerous ornaments, Mike has several tips. "First, partially turn the bottom—the portion farthest from the headstock," instructs Mike. "Then, work on the middle and the top. Finally, repeat the process starting at the bottom again. If you turn one area completely, the ornament may get too thin and snap. If you don't have a screw center, turn the ornament between centers with the top (screw-eye end) against the tailstock. The tailstock center mark will eventually become the point of insertion for the screw eye." Use the full-sized patterns to turn your own ornaments.

### SAND AND PAINT

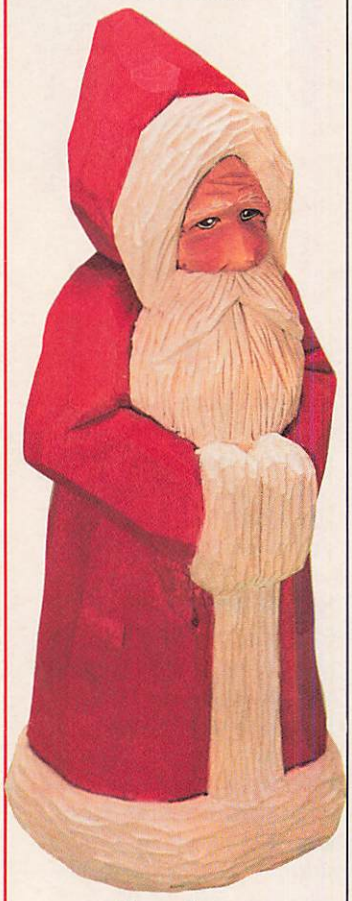
Sand the piece with 220-grit paper, and paint the ornament on the lathe, with the lathe running at around 600 rpm. Mike has had the best luck with stiff-bristle brushes, about ¼" long by ¼" wide. "I use water-based acrylic paints of thick consistency, about like cream. Apply the paint heavily, just short of the coloring flying off."

After the paint dries, remove the ornament from the lathe, and cut off the scrap end. Sand and paint the ends. Finally, insert a small screw eye and hang.

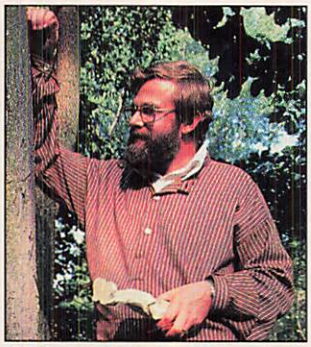
Photographs: Bob Calmer; David Haas  Illustrations: Kim Downing; Bill Zaun

# CARVE FATHER CHRISTMAS

## An Old World yuletide symbol by Harley Refsal



**One in a collection of regional patterns from the nation's top carvers**



**Harley Refsal**

Carver Harley Refsal makes his home in Decorah, Iowa, historic gateway for Scandinavian immigrant pioneers of the upper Midwest. Born in Minnesota of a Norwegian farm family, Harley knows firsthand the rural folk he likes to carve in caricature.

His rough-surfaced carving style lends itself well to the rough-hewn individuals who broke prairie ground. Harley calls the style "flat-plane" carving because it leaves the flat plane of each cut on the wood. "With this style," Harley explains, "a few lines and cuts can say a great deal."

At Christmas, Harley delves into his Scandinavian heritage to carve seasonal symbols. His favorite yuletide carving is Father Christmas. "Historically, the figure belongs to many Old World countries," he notes. "Father Christmas is not Santa Claus bearing gifts, but a spirit of love, goodwill, and caring."

The *WOOD*® staff whittled Father Christmas at a workshop taught by Harley. The results were so pleasing we thought we'd share the pattern.

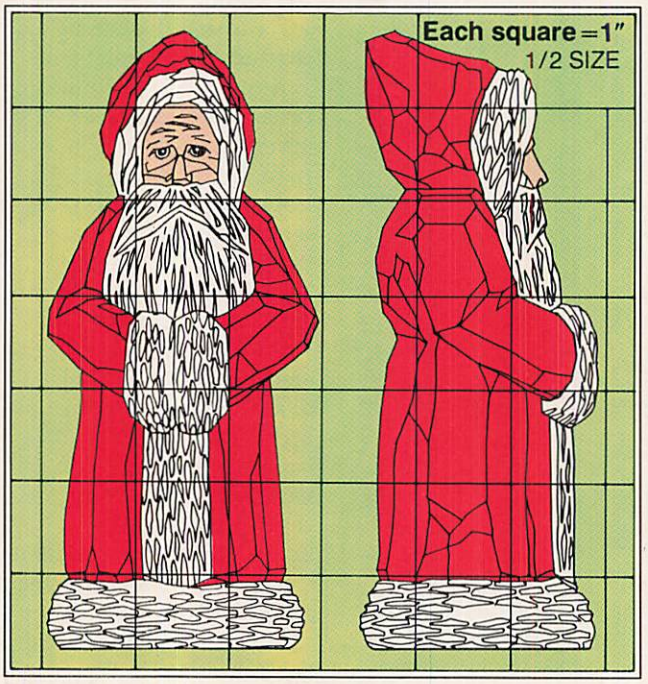
### CARVING AND FINISHING FATHER CHRISTMAS

Harley carves air-dried northern basswood that he often harvests himself from the nearby wooded hills and valleys. This figure requires a 3x3x7″ block of basswood or other paintable wood.

"The object is to carve the square block into a cylindrical shape," Harley says. "Pencil in a circular guideline on the base to follow. When you get to the arms, forget about roundness! The line from elbow to coat cuff on each must be straight."

Texture the figure's beard and mustache with a narrow-angled V-tool. To give the fur trim a different look, switch to a small gouge.

Norma, Harley's wife, finishes his carvings. She thins acrylics to a wash consistency and brushes them on. "This method lets the wood-grain show through," explains Harley. "For a shadow effect, dip the colored figure in a mixture of boiled linseed oil and umber artist's oil color — about one teaspoon color to a quart of linseed oil. When it's dry, buff the carving with a wool sock for an old, well-handled look."




For a full-sized carving pattern, send a self-addressed, stamped, business-sized envelope to: FATHER CHRISTMAS CARVING PATTERN, *WOOD*® Magazine, Locust at 17th, Des Moines, IA 50336. **Offer expires April 30, 1989.**

Design: Harley J. Refsal
Photographs: Jim Elder; Jim Kascoutas

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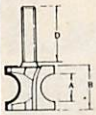

| PART NO. | A | PRICE |
|---|---|---|
| SY9-1 | 1/4 | $12 |
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| SY-9-3 | 3/8 | $14 |
| * SY9-3½ | 3/8 | $14 |
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| * SY9-8½ | 1 | $17 |
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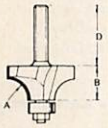

| PART NO. | A | PRICE |
|---|---|---|
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| S504Y | 1/8R | $11 |
| S506Y | 3/16R | $11 |
| S508Y | 1/4R | $11 |
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| S512Y | 3/8R | $14 |
| S516Y | 1/2R | $16 |
| * S516Y½ | 1/2R | $16 |
| * S520Y½ | 5/8R | $20 |
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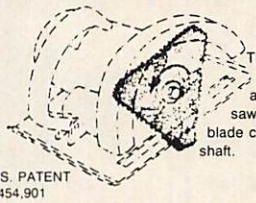

The MIRACLE SAW BLADE fits on any portable electric saw with 7¼" circular blade capacity and 5/8 inch shaft.

U.S. PATENT 4,454,901

This MIRACLE SAW BLADE cuts circles, curves and goes frontwards, sideways or backwards, on wood, processed and artificial wood.

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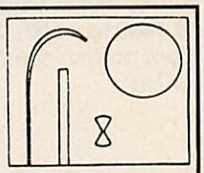
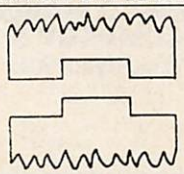
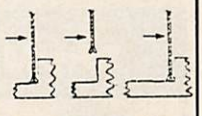
Acts like a router, a saw blade, a planer, a dado. Maximum depth of cut is 1¾. Can be resharpened.



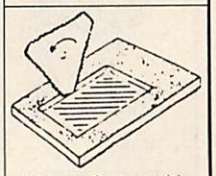
Typical shapes and cuts possible with the MIRACLE SAW BLADE.



Use as a dado. 1 blade does it all.



Use as a router. Saw cuts sideways.



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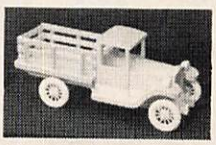

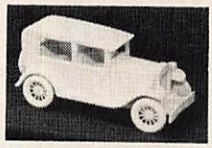

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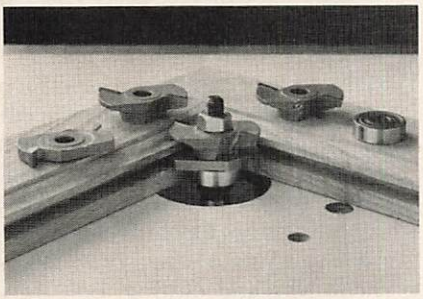
If you'd like to try carving, and you enjoy making your own Christmas decorations, why not grab a block of wood, a knife, and a little advice from Ron Ransom and do something about it.

Here's an easy introduction to wood carving that the old elf himself might even enjoy. The three-piece set includes Ransom's 1987 book, *Santa Carving*, a carving knife, and a block of basswood. The block comes precut to just the right stage of preparedness for a beginner and the book features simple instructions and illustrations. Upon successful completion of the first Santa carving—mine took 35 hours but was all fun—Ransom encourages the novice to take the next step and design his own.

—Tested by Steve Oswalt, a Des Moines woodworker, and frequent contributor to *WOOD®* magazine.

*Santa carving kit (item 13E70), $17.95 ppd., from Woodcraft, Dept. WBH11D, 41 Atlantic Ave., Box 4000, Woburn, MA 01888.*

## A FIT BIT FOR STILE-AND-RAIL CONSTRUCTION



Amana's reversible stile-and-rail set performs well with or without a router table, although it took a little trial-and-error adjustment to get my opposing cuts to line up. But with just a little practice, it's easy to turn out classy frames or molding cuts. The carbide-tipped bit also cut a nice slot for splines and does accurate tongue-and-groove work. The set includes three styles of blades: Roman ogee, classical, and standard, in addition to the tongue-and-groove blade.

—Steve Oswalt

*Amana stile-and-rail bit set (item no. 801-566), $196.50 ppd., from Woodworker's Supply of New Mexico, 5604 Alameda Pl., NE, Albuquerque, NM 87113; 800-645-9292.*

*Continued on page 88*

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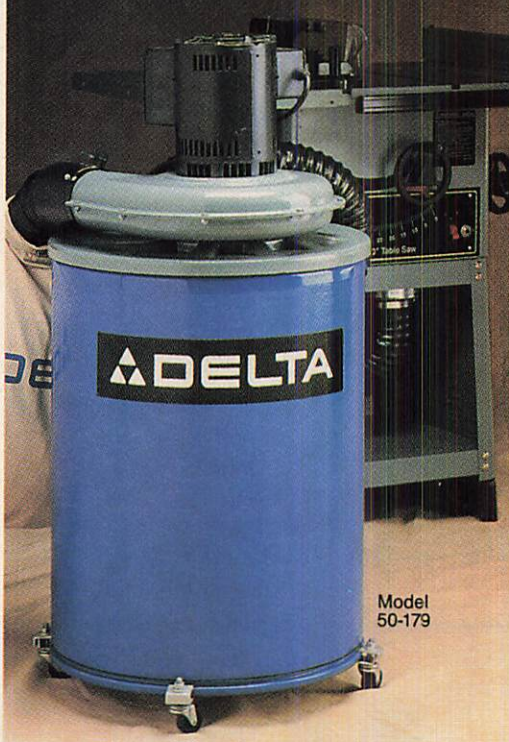


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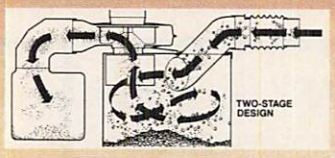


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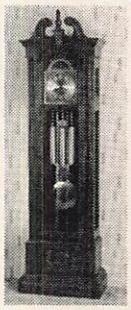

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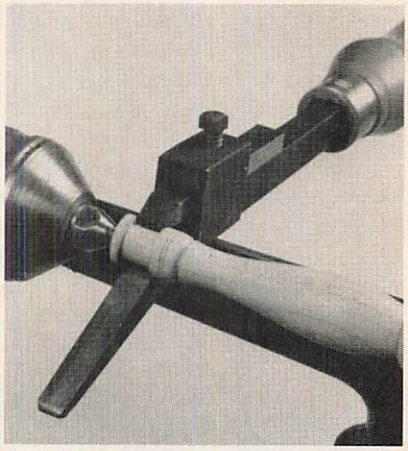
*Continued from page 87*

### TENON TURN-ON



Simple ideas can lead to spectacular solutions, and this idea seems so obvious that many woodturners will wonder why they didn't think of it. Undoubtedly, some shop tinkerers have invented their own versions of this combination measuring and cutting tool. However, we haven't seen a tool like this marketed before.

The problem: How to consistently turn tenons that fit a mating hole. Removing the part from the lathe to check the tenon's fit or continually measuring tenons with a caliper is time-consuming, so Iowa woodworker Rick Reeves came up with a solution: Attach an extendable cutting edge and angle iron to match the hole size.

The hefty tool performed well in our test, cutting accurate tenons with good balance. Reeves' turning tool comes in two sizes. The smallest cuts ⅜"-long tenons, from ¼" to ¾" in diameter. The largest cuts a ⅝"-long tenon, ½" to 1½" in diameter. Reeves makes the handles from cherry, maple, or walnut, depending on the hardwood being used in his shop at the time.

—Tested by Marlen Kemmet, *WOOD* magazine's How-To Editor and a turning enthusiast.

*Reeves' Woodturning Sizing Tool; $52.50 ppd. for the ⅜" diameter tool, $82 ppd. for the ⅝" diameter tool, from Reeves Woodworks, R.R. 1, Marengo, IA 52301.*

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I gave the two-speed Freewheeler a full charge and got more than 30 minutes use out of it, using it first to help shape a set of cabriole legs. Before the Dremel tool, I was using a sanding sleeve chucked in a hand drill to do the job, and was amazed at how much quicker the Freewheeler did the work.

On the same charge, I polished some turning tools, and sharpened a cannelated gouge. A half hour of running time per charge appears to be about average for most uses, according to the owner's manual.

But for some heavy-duty uses, such as cutting or grinding metal, Dremel says a full charge may last only 10 minutes. Once the tool has run down, it takes three hours to fully recharge.

Accessories include cutters (high-speed, engraving and tungsten carbide), polishing points, router bits, mandrels, wire brushes, and grinding stones. A speed-setting chart in the owner's manual serves as a handy reference guide.

—Steve Oswalt

*Dremel Freewheeler sells nationwide at hardware, tool, and hobby stores. The basic model 850 lists for $71.50; the model 8500, which includes 30 accessories and a stand, lists for $94.50.*

*Continued on page 91*


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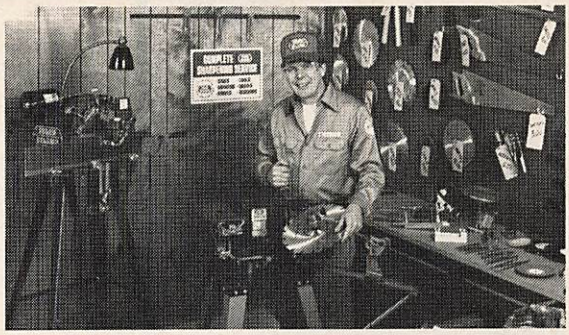

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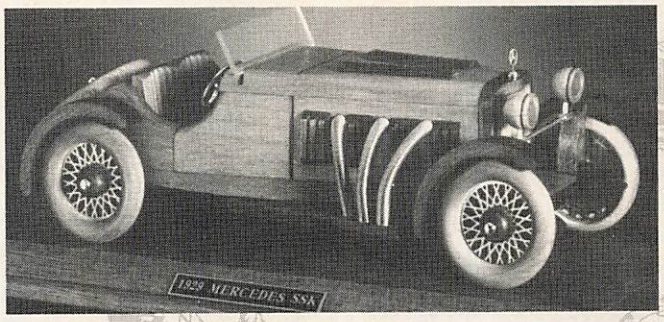


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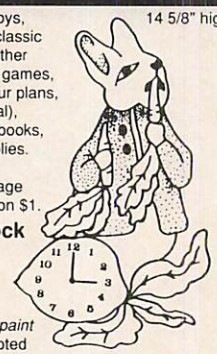


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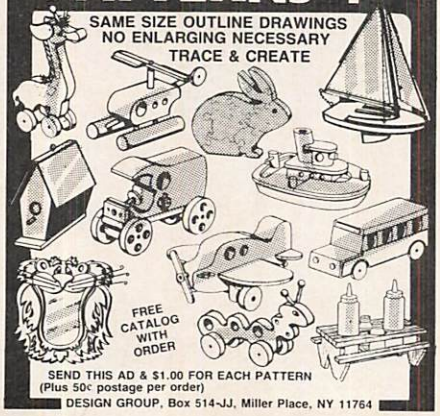


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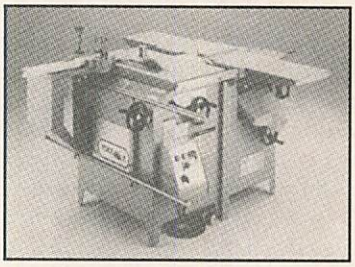

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*Continued from page 89*

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—Tested by Jim Downing, *WOOD*® magazine's Design Editor.

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—Marlen Kemmet

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*Rust-Oleum Wood Saver, available at many paint, hardware, and department stores. The manufacturer said retailers generally sell the 11-oz. aerosol for $3.99; ½-pint can, $3–$3.19; and quart, $7–$7.50.*


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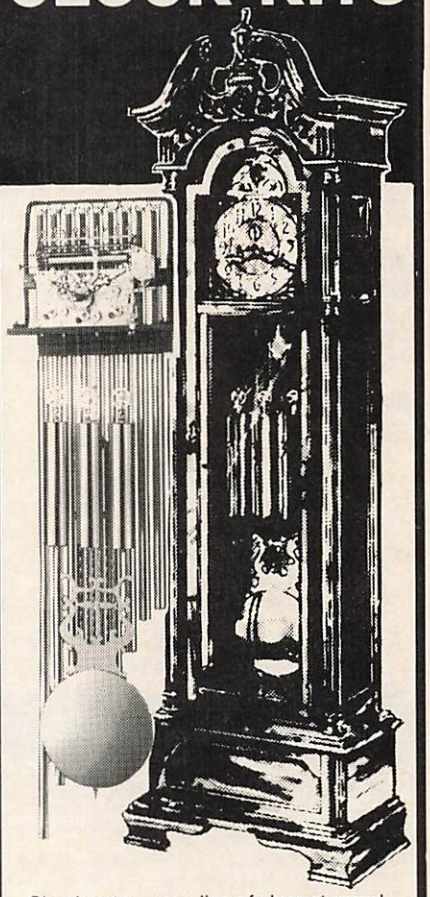

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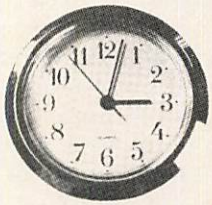

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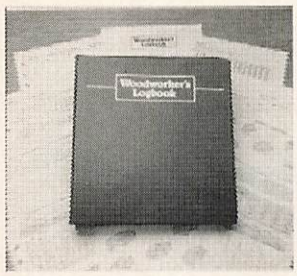


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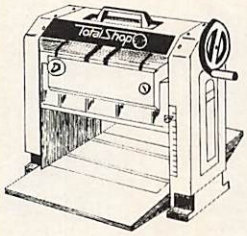


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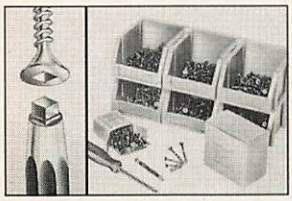

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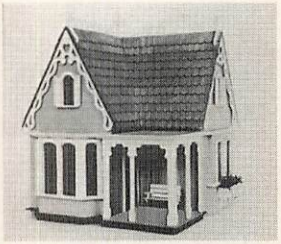

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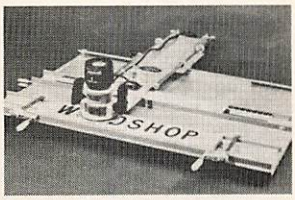


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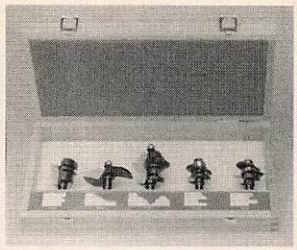

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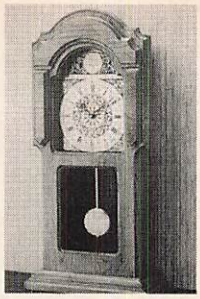

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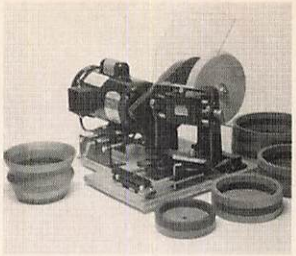

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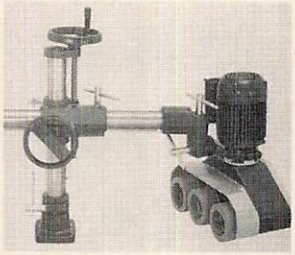

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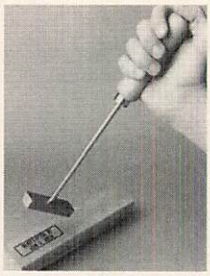

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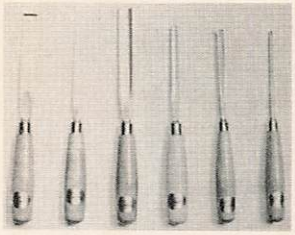
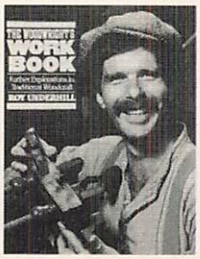
The JS100 Jointer System features double insulation, cast aluminum and high impact plastic housing, joining edge-to-edge or at 45° & 90° and fits all 3 sizes of standard splines (biscuits). WOOD readers special Holiday price of $169.95. Call today (803)779-3131 or write to: HILLER HARDWARE, 1411 Assembly St., P.O. Box 1762, Columbia, SC 29202-1762.



The finest in Carving Tools Ashley Iles. The York set is ideal for the beginner. It gives the carver the basic tools for setting in, roughing out and a certain amount of detailing. Set is comprised of the following tools: #1—5/8" Chisel; #3—3/8" Gouge; #5—5/8" Gouge; #9—1/4" Gouge; #11—1/16" Veiner; #39—1/4" VTool. Special Holiday Price only $89.95 ppd. Order now (305)793-1557 or write HENEGAN'S WOODSHED, 7760 Southern Blvd., W. Palm Beach, FL 33411.

This new 10" Motorized Miter Box from Delta can cut a 2" X 6" at 90° or a 2" X 4" at 45° in a single pass. Unique drive system eliminates costly repairs; remains more accurate. Cuts framing, flooring, trim, moulding, plastic pipe and aluminum extrusions. Special Holiday price price only $179 with carbide blade only $219 from W.S. JENKS & SON, 1033 Montana Avenue NE, Washington, DC 20002. 1-800-638-6405.



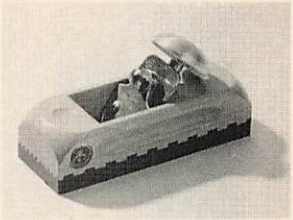

Books by Roy Underhill. The creator of "The Woodwright's Shop" for PBS is also the author of three terrific books on hand woodworking: *The Woodwright's Shop, The Woodwright's Companion,* and *The Woodwright's Workbook.* $13.95 each, postpaid. Send check or MC/Visa info. to UNIVERSITY OF NORTH CAROLINA PRESS, P.O. Box 2288, Chapel Hill, NC 27515-2288, 919-966-3561.

Footrest pivots 360° to your personal comfort angle, or gentle rocking motion eliminates tension. 8 3/4" high, 17 1/2" deep. Full-size plan, step-by-step directions, plus Roto-Hinges and other hardware: $5.75. Extra component pack: $2.50. Gift certificates in any denomination for purchases from *Plan and Tool* Catalog. RJS CUSTOM WOODWORKING, P.O. Box 12354, Kansas City, KS 66112.

The Dupli-Carver is a wood duplicating machine that can reproduce three dimensional carvings in wood. The machine uses a stylus (tracer) to follow the contours of a statue or plaque, while a router carves a duplicate. Two models starting at $359 WOOD-MIZER®, 8180 W. 10th Street, Dept QQ29, Indianapolis, IN 46214. Phone: 1-800-553-0219, or in Indiana–317-271-1542.

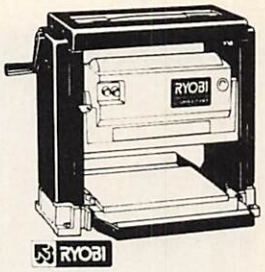
Holiday Candle Holder. Made from a wheel, spindle, candle cup and insert. Wood parts and dowels from MIDWEST DOWEL WORKS, INC., 4631 Hutchinson Rd., Cincinnati, OH 45248.

The RBI Hawk Family of Precision Scroll saws—6 models available, one designed to suit your needs. Patented camover tensioning for ease of inside cuts and blade changes. The best saw for your woodworking dollars—Made in America. RBI, 1801 Vine, Harrisonville, MO 64701. 1-800-535-8665.



Buy this superb wooden block plane for about the same price that you pay for a high quality steel plane. Lightweight hornbeam body and super-tough lignum vitae soleplate. Was $40; Holiday Special $35 ppd. Catalog $1.00 (refunded with first order). HAMMERMARK ASSOCIATES, Box 201-ABW12, Floral Park, NY 11002.

Patterns by Design Group—Toys, Games, Puzzles, Birdhouses, Rocking Horses, Cars, Trucks, and MORE! All patterns are "Same Size" Blueprints. No enlarging necessary. Simply trace and create. Money Back Guarantee. For Design Group's fully illustrated catalog send $1 to DESIGN GROUP, Box 514 JJ,Miller Place, New York, NY 11764.

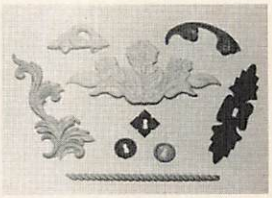



Take this Ryobi 10" portable planer with you from jobsite to jobsite. You can have the planer only for $367; or take advantage of our special holiday deal & get the planer along with a Ryobi S500A 1/6 sheet pad sander for only $387! Free Freight. Order today from THE SOURCE, 7305 Boudinot Drive, Springfield, VA 22150. Call 1-800-452-9999, in Virginia call 1-800-468-1778.

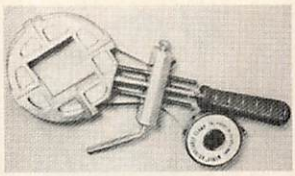
Build tomorrow's heirloom today! "Merrilegs" is designed to capture the spirit and beauty of a child's loyal steed as well as provide pleasure and satisfaction for the woodworker. Build this Rocking Horse using our full-size, easy-to-make plan. Plan #121, $12 ppd. Catalog of 200 professionally designed plans for building furniture—$2. FURNITURE DESIGNS, INC., 1827 Elmdale Ave., Glenview, IL 60025; UPS COD 312-657-7526.

Pro-quality hammer has fully polished head and white hickory handle to make it a beautifully balanced Vaughan hammer standout. Perfect choice for the woodworker who knows that the right tool makes the job easier. Available at fine stores everywhere. VAUGHAN & BUSHNELL MFG. CO., 11414 Maple Ave., Hebron, IL 60034. 815-648-2446.

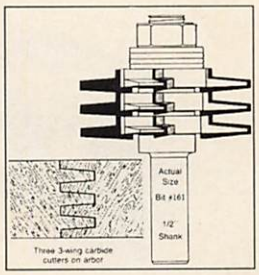
The Makita 6093 DW drill comes complete with a one hour fast charger, 9.6 volt battery, steel carrying case, and double-ended phillips bit. The 6093 DW drill kit is variable speed (0-400 and 0-1100 RPM) with six position clutch for a variety of fastening applications. List price $248, yours for $119. TOOLS ON SALE, 216 W. 7th St., St. Paul, MN 55116. Call toll free 1-800-328-0457; in Minnesota 612-224-4859.



Easily produce molds like these with new Dupli-Kit. New plastics make parts in 4-6 minutes; cost only pennies. Look and feel like real wood; color to match. Complete instruction manual shows how to produce turned finials, glass knobs, brass hardware parts, pressed wood ornamentation, more. $350.00 complete. MINUTEMAN, INC., Dept. 17C, 115 N. Monroe, Waterloo, WI 53594. Furniture Restoration catalog $2.00; FREE workshops.

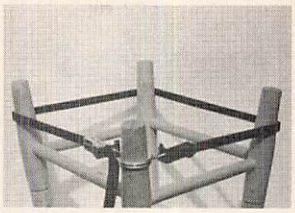


"Merle," the adjustable corner clamp, forces your project into square. Full adjustable from 2⅝" × 2⅝" to 36" × 36". Perfect for anything that requires 90 degree corner clamping. Cast aluminum and steel construction; quick and easy to use. $22.95. MLCS LTD., P.O. 4053D, Rydal, PA 19046 or call toll-free 1-800-533-9298. Visa/MC.

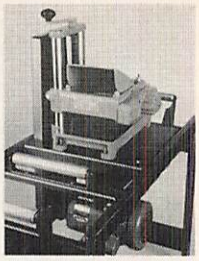



Finger Joint Router Bit. At last, a professional production quality bit that makes better edge and end grain joints by increasing the glue surface area. This bit is ideal for joining particle and composition board, makes super strong mitre joints. Quick and accurate setup. The Finger Joint Bit replaces mortise and tenion in many cases. Special offer order item #161 ONLY $69. MLCS LTD., P.O. Box 4053 D, Rydal, PA 19046. Visa or M/C call toll free: 1-800-533-9298.

Complete power-feed Drum Sander with stand and motor. 12″ & 26″ models. In seconds produces satin-smooth finish impossible to duplicate by hand methods. Send for Free Information kit. WOODMASTER TOOLS INC., P.O. Box 412551, Kansas City, MO 64141.



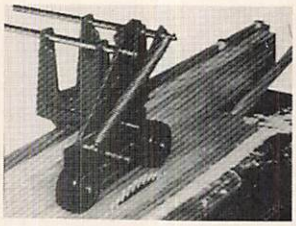
Quick clamp secures wood and other materials without the cumbersome bulk of bar clamps. It's adjustable, easy to use, and convenient to store and carry. This versatile tool gives you an extra pair of hands for assembling, clamping, gluing,tiedown, packing, and bundling. THOMAS CLAMP CO., Box 237, Arab, Al 35016. 205-586-3063.



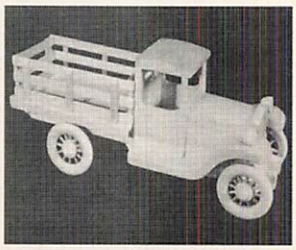
Anytime, Anywhere, Any wood—with the W&H Molder Planer. Picture frames, crown moldings, raised panels and more! Fast two-minute changeover makes it easy to plane hardwoods and cut moldings. Five year warranty and free 30-day trial. WILLIAMS & HUSSEY MACHINE CO., INC. Wilton, NH 03086. 1-800-258-1380.

Solid cherry commode table $169. Ready to assemble, 20″ X 27″ X 22″high. Also available in walnut, oak and mahogany with matching coffee table. Shipped from stock. FREE brochure. ADAMS WOOD PRODUCTS, INC., 974 Forest Dr., Morristown, TN 37814. Or call 615-587-2942.

Receive *The Mallet* magazine each month for one year, a membership card for museum admissions, purchasing, exhibiting and publishing benefits PLUS *The Wedge Head* by Kent Bailey. Send your check or money order for $15.00 to: NATIONAL CARVERS MUSEUM, 14960 Woodcarver Rd., Monument, CO 80132, or use Visa or MC by calling 719-481-4737.

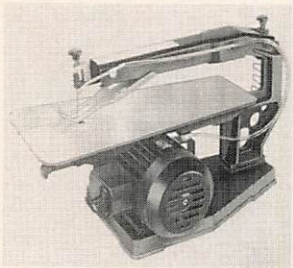


If you value your fingers you need a RIPSTRATE®. Holds the work tight against the fence with no hands near the blade; makes perfect cuts; wheels lock to prevent kickbacks. No adjustment needed for stock width or thickness. One-year guarantee. $69 ppd. +$3.50 s&h. Check, M.O., Visa or MC. Free brochure. FISHER HILL PRODUCTS, 4 Fisher Hill, Fitzwilliam, NH 03447; 1-800-421-0256.



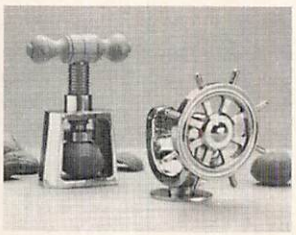
Executive wood toys! Now you can create this 1929 Ford showpiece and many others like it from our detailed and easy-to-read patterns. We offer you a complete line of patterns, parts and wheels. Make this day a time to remember with one of our executive wood toys! Send $1 for catalog to: TOYS AND JOYS, Box 628 GL, Lynden, WA 98264.

Kuempel chime clock kits are individually handcrafted by master craftsmen in solid walnut, cherry or oak. Choose tubular bell or rod movements with lyre pendulum and hand-painted moonwheel. For catalog send $2 to KUEMPEL CHIME CLOCK WORKS, 21195 Minnetonka Blvd., Excelsior, MN 55331-8605, 612-474-6177.

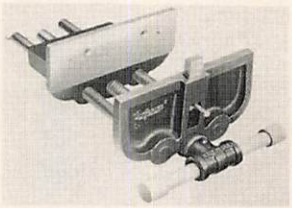


Penn State's Super 15″ Scroll saw offers quality, performance, specifications, and features equivalent to Scroll Saws sold for many times it's price. Sale price includes a money back guarantee, one-year warranty, plus free dozen blades, extra blade holder set, and plastic lettering guide and patterns. Only $129.95, (add $15 for optional dust-blower) plus $10 UPS shipping. PENN STATE INDUSTRIES, 2850 Comly Road, Philadelphia, PA 19154. (215) 676-7609.

Rare imported exotic and domestic hardwoods—the world renouned Martin Guitar Company sells wholesale and retail exotic woods (4/4, 6/4, 8/4) and sawn veneers (⅛″ and ¼″ sanded stock) plus guitar parts, kits, accessories and second quality guitars, Sawmill-/Woodworker's Dream 1-800-247-6931; 215-759-2837 in PA. Cat. and info. upon request. THE MARTIN GUITAR CO., 510 Sycamore St., Nazareth, PA 18064.

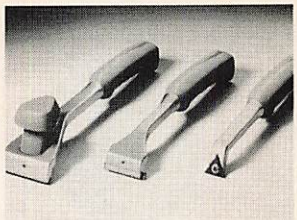


Brass Nut Crackers add a touch of distinction to your holiday table. Made of solid brass, finely machined and polished, they bolt onto your crafted bowls, bases and platters. Threaded mainscrews crush the hardest nuts. Available in two styles (wood not included)–Letter Press $17.50 ppd.; Ship's Wheel $19.50 ppd. WOODCRAFT SUPPLY CORP., Box 4000, Woburn, MA 01888, 1-800-225-1153.



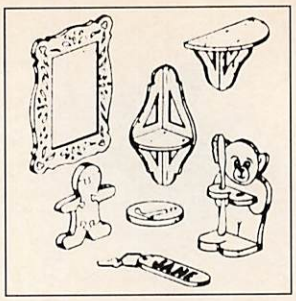
Woodworker's vise comes in two sizes, 9″ with a 4″×7″ jaw size or 12″ with a 4″10″ jaw size; these vises have many features that can help any woodworker create a multitude of projects, with ease for many years...why because it's made by Jorgensen. Write for our catalog to: ADJUSTABLE CLAMP COMPANY, 410 N. Ashland Avenue, Chicago, IL 60622.

Build this 40" high Chicago Victorian Doll House from standard ¾" lumber. You get five huge 34"×44" sheets of blueprints and patterns for 22 pieces of furniture. $17.99 ppd. MEISEL HARDWARE SPECIALTIES, P.O. Box 70, Mound, MN 55364.



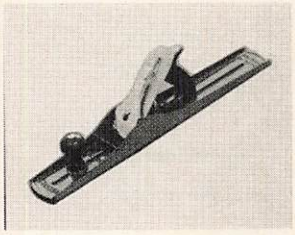
Super tungsten carbide paint scrapers. Replaceable carbide blades and rugged handles assure long life. Perfect for painters and do-it-yourselfers. Sale priced at $6.30 each for 1" or 2" width and $18.50 each for heavy duty 2½" width. To order phone BUCKEYE SAW at 1-800-543-8664 or at 513-621-2159.

Edico is offering a bundle of lumber. 10 board feet of ⅜" shorts, 3" and wider, 18" - 36" long in cherry, oak or walnut. Includes a "How To" project book and top-grade lumber catalog! Only $39.95 delivered. Specify species and send check or money order to EDUCATIONAL LUMBER COMPANY, Box 5373 W, Asheville, NC 28813.



Over 200 Full Size Patterns for jigsaw, scroll saw and band saw enthusiasts. Create decorative shelves, mirrors, household racks, novelties, puzzles, children's items, alphabets and much more! Enjoy these profitable trace and cut projects PLUS our woodcraft brochure for only $7. ACCENTS IN PINE, Dept. JA118, Box 7387, Gonic, NH 03867.

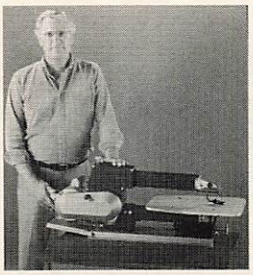
This S Model Foredom power grinder features powerful 1/8 HP motor, speeds range 0-15,000 rpms, electronic foot control, 44B handpiece with 1/4" collet & Foredom's name brand reputation. List price $189, Special Holiday price $176.50. Order today—catalog #042139. Call 1-800-221-9474 or write P.C. ENGLISH ENTERPRISES, P.O. Box 380, Thornburg, VA 22565.



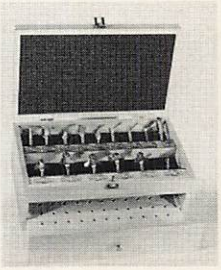
Record #07 22" Jointer Plane. Record has reputation of uncompromisingly high standards for producing planes. Features are: razor sharp tungsten vanadium cutter, cast iron base, frog & lever cap, traditional brass adjusting nut, select hardwood knob & handle. $95 ppd! R.A. NESS CO., The Woodworkers Emporium, 8888 N. Milwaukee Avenue, Niles, IL 60648. 312-824-0565.

Give SignCraft this Holiday Season. SignCraft puts a woodworker's skills to work in a rewarding field—signmaking. Features include wood and painted signs plus many other types of handmade signs. $24.00 per year (6 issues), outside the U.S. add $7.00 (U.S. funds, please). Free descriptive brochure also available. SIGNCRAFT MAGAZINE, P.O. Box 06031, Ft. Myers, FL 33906.

Sand on a cushion of air! We supply 5 free "flexible" sanding sleeves to go along with the 1½" diameter × 4" long heavy-duty sander. Chuck into your drill press or drill, (⅜" shaft incl.in drum), & quickly polish out scratches, burns, & cutting marks. $29.95 + $2.50 s&h. Cat. #01605. INDUSTRIAL ABRASIVES CO., 642 N. 8th St., Reading, PA 19603. 800-428-2222, 800-222-2292 (PA ONLY).

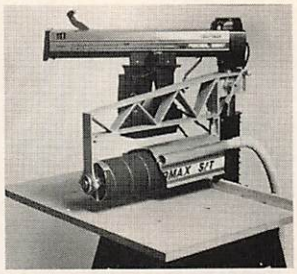


Cut the most intricate patterns in wood, plastics, light metals, etc. Add your own ¼ hp electric motor to an Excalibur II, and start cutting! $579 US. Includes 72 blades, wrenches, & manual. Try it for 30 days. Satisfaction guaranteed. Call 800-387-9789, in Canada call collect 416-291-8190. J. PHILIP HUMFREY INTERNATIONAL, 3241 Kennedy Rd., Unit 7 Scarborough, Ontario, M1V2J9.

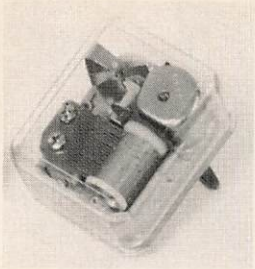


The Byrom 15-piece, ¼" shank, professional carbide router bit set comes packaged in handcrafted wooden chest and features hidden storage compartment that holds up to 80 bits. MADE IN THE U.S.A. Suggested list price $395, on sale now at participating dealers for $199.95. Contact Byrom for the dealer nearest you. BYROM INTERNATIONAL, P.O. Box 246, Dept. HW-1, Chardon, OH 44024. 1-800-722-5447 or 216-285-2341.

New book by Patrick Spielman is perfect gift for anyone who owns router or is planning to buy one. With over 800 photos and drawings, it's practical encyclopedia of routers, router bits, jigs and fixtures and router tables. Our new cat., devoted solely to woodworking books (over 500) and videos (over 50), will be sent free ($2.00 value). Send $15.00 to MANNY'S WOODWORKER'S PLACE, 602 S. Broadway, Lexington, KY 40508 or call 1-800-243-0713. Personal checks, M/C, Visa accepted.

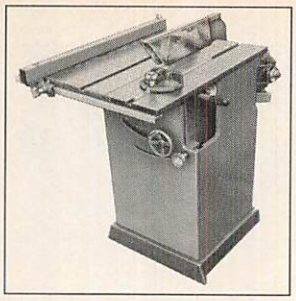


Performax Surface/Thickness sander is the affordable component drum sander with new power feed option & metal stand. Buy components to fit your budget & needs. Performax S/T Sander will attach to radial saw, wooden stand (hardware kit available) or to our new metal stand. New variable speed conveyor system works on all three & provides effortless & flawless sanding of 44" wide boards. PERFORMAX PRODUCTS, INC., 17065 Judicial Rd., Lakeville, MN 55044. 1-800-334-4910.



Music box movements for creative Christmas gifts. Put them in a jewelry box, manger scene, dollhouse, treasure chest, toybox, stuffed animal, pillow, or whatever you make. Over 70 melodies available, only $5.95 each. Catalog $1.00. ST. CROIX KITS, 423-B S. Main Street, Stillwater, MN 55082. 612-439-9120.

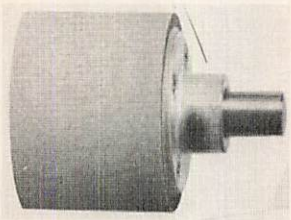
Introducing two new router bit kits for professional and industrial use. The Woodmaster 12 has twelve router bits, and the Woodmaster 8 has eight. Industry's most usable ¼″ shank router bits in a handsome mahogany and pine storage case. Premium carbide tipped router bits are machined and ground to industrial standards. DML INC., 1350 S 15th St., Louisville, KY 40210. 1-800-233-7297.



Order now and save on low cost of this commercial quality 10″ table saw kit. Only $71.99! No need to decide between quality and price. Comparable value $1000 to $1500. A woodworkers dream! GILLIOM MANUFACTURING, P.O. Box 1018, St. Charles, MO 63302.

You can build this wooden wind toy and many others from kits designed for all skill levels. Send $1 for a sixty-page color catalog to CHERRY TREE TOYS, Box 369-309, Belmont, OH 43718 or call 614-484-4363.

Like a third hand. Provides that extra support so often needed. Its rugged, heavy-duty, all-steel construction makes it a tool you'll depend on for years. Roller is 13″ long, galvanized and ball bearing. Adjusts in height from 25¾″ to 45″. When done, it folds flat #HPR-13 $39.95 + UPS. HTC PRODUCTS, INC. Toll free 1-800-624-2027; (in Mich) 313-399-6185.



Simply cut sandpaper from standard sheets for these sleeveless drum sanders. Special: 1″ × 3″ & 2½″ × 3″ set, $27.95 + $2.50 s/h. Many other sizes available. Money-back guarantee. send check to SINGLEY SPECIALTY CO. INC., P.O. Box 5087B, Greensboro, NC 27403.

Assorted woodworking supplies including dowel pins, candle cups, buttons, needle boxes, wooden fruit, napkin rings, balls, salt & pepper shakers, toy wheels, and many more wood and metal accessories. Write for our free catalog: BENNY'S WOODWORKS, P.O. Box 656, Antioch, TN 37013. 1-800-255-1335; TN 615-331-8384.

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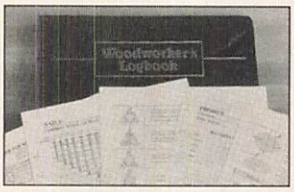
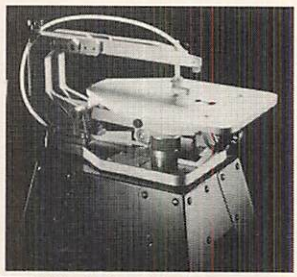
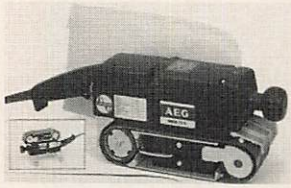
EMCO unimat 3 miniature machine system is excellent hobby tool. Widely used by modelers & miniaturists. Versatile system can perform precision machining of wood, plastic & metals. In addition to base function as miniature metal turning lathe, also has wide assortment of accessories to do milling & drilling, circular sawing, fret & jig sawing, wood turning & more. For info. on this & other woodworking machines contact Jeff Green, HOBBY PRODUCTS, 2757 Scioto Pkwy, Columbus, OH 43026-2334. 614-771-5996.




Woodworker's Logbook offers wealth of information on tools, hardware and supplies with an indexed project section to record data on various projects as you build. Tabular material includes lumber and plywood standards, screw sizes, bit speeds. The cloth covered binder is 2½″ thick and opens flat. $22.95 ppd. from GARRETT WADE, 161 Sixth Ave., New York, NY 10013. 1-800-221-2942.



Affordable 14-inch, 3 speed ScrollMate is perfect Scrollsaw for cutting hard or soft woods up to 2″ thick, plastics, non-ferrous metal and more. It offers a built-in air bellows; stand; quick, safe speed changes and a Full Two-Year Limited Warranty. Call SAKURA, U.S.A., 800-533-3728, for more information and name of your nearest Dealer.




AEG 3″ X 21″ Electronic Variable Speed Belt Sander has state-of-the-art dust collection system. List price $249.00—Special price only $156.95. Includes dust bag & 2 stationary supports for bench use. Also available options sanding frame, purrel fence, and vacuum attachment. Call 1-800-445-1419 USA; 1-800-330-5057 in FL (res. add 6% sales tax). TOOLS-TO-GO, 15935 NW 57th Ave., Hialeah, FL 33014.

☐ Build this handsome 38" Wooden Rocking Horse yourself from our kit which includes solid wood parts, cut and shaped, with all the trim. $69 ppd. CK or MO. TAMPA WOOD PRODUCTS, INC., P.O. Box 14427, Tampa, FL 33690. 813-251-6583.

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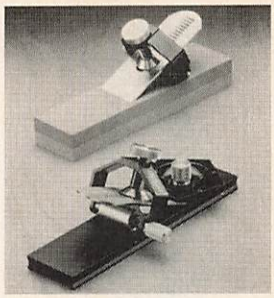
☐ 16-piece American-made countersink set in beautiful hardwood case. Set has taperpoint drills and countersinks for #6, #8, #10, #12, #14 screws. It also comes with 3/8" and 1/2" stop collars plus matching plug cutters. Everything you need. FL-8000 $56.80. WOODWORKS, P.O. Box 14507-P, Ft. Worth, TX 76117; 817-281-4447.



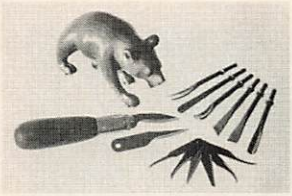
☐ Obtain the sharpest edge possible with the Veritas Precision Honing Guide. Takes chisels & plane irons up to 2 1/2" wide and 5/8" thick. Only $19.95, we pay shipping. With optional Angle Setting Jig, only $29.95. WOODLINE the JAPAN WOODWORKER, 1731 Clement, Alameda, CA 94501.

☐ Unlock your creativity with our new Model 435 Scroll Saw. Features extra large 20" throat and 2" depth of cut, chuck that allows blade to rotate full 360°, 12" X 12" cast-iron worktable that tilts from 0° to 45° left or right, variable speed control for motor that adjusts cutting speed from 600 to 2,000 strokes per minute. FOLEY-BELSAW COMPANY, 6301 Equitable Rd., Dept. 42021, Kansas City, MO 64120.

☐ Now you can lay out precise letters and numbers for your wood craft projects. Scrollsawers and sign carvers use these specially designed lettering layout guide sets. Quick and easy-to-use—simply trace around the letters—guides are very durable. several styles and different sizes are available. Brochure $1. SEYCO SALES, 1414 Cranford Drive, P.O. Box 472749, Garland, TX 75047.

☐ Band saw owners! A new tool is now available that enables craftsmen to make or repair any length band saw blade! Our splicer is available in two models: 1C-001 for 1/4" to 3/4" blades and 1C-002 for 1/8" to 3/8" blades each $49.95 ppd. Comes complete with instructions and supplies for approximately 100 splices. NEW MILFORD SPECIALTIES CO., Dept. BHG, P.O. Box 241, Botsford, CT 06404-0241. 203-426-4276.

☐ If you enjoy woodworking, a versatile Marlin Wood Carving Machine may be just what you need. Three-dimensional carving of sculptures, plaques, panels and mouldings is easy. Wood sign carving is simple. Available in three sizes. $1 for complete catalog and price lists. MARLIN INDUSTRIES, INC., Route 70, Box 191, Cashiers, NC 28717; 704-743-5551.



☐ Warren tools give you the edge! Complete set of woodcarving tools honed ready to use. Get the combi T-4 and a durable compact toolbox for $57.75 ppd. (Bear shown above not indluded). Also send for our catalog ($1) NY residents include sales tax. Send check or MO to: WARREN TOOL CO., INC., Routte 1, Box 14-A, Dept. W, Rhinebeck, NY 12572 or call 917-876-7817.

☐ Moisture-related problems such as shrinking; warping and cracking can ruin the most beautiful wooden pieces built. Avoid wood moisture problems by checking the wood with a moisture meter! The pocket-size Mini Ligno moisture meter is for the serious hobbyist and professional woodworker. LIGNOMAT, P.O.Box 30145, Portland, OR 927230; 503-257-8957 or 800-227-2105.

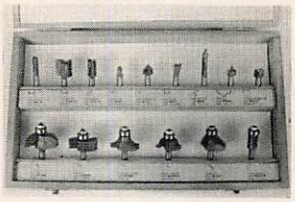
☐ Sanding odd shaped parts becomes routine, sanding to a line very simple & quick. Perfect for grinding, sharpening, sanding, & polishing. Overall size is 14" X 8 1/2 X 11". Belts are resin bond aluminum oxide with cloth backing. Made in Taiwan to Delta's strict standards. #801-542, 1" X 30" belt, $7.90; assortment (2 ea. 80, 100, 120, 220 grit)(1 ea. 400). WOODWORKER'S SUPPLY OF NEW MEXICO, 5604 Alameda Place NE, Albuquerque, NM 87113.

☐ Sanding abrasive cleaner works like giant eraser to remove wood, plastic and metal from sanding belts, sheets, discs and drums. Long lasting abrasive cleaners are clean, safe, and non-toxic. For use with all kinds of abrasives on any power tool. Will not harm the grit or the power tool in any way. LMAC2212, 2" X 2" X 12" at $11.95 each. THE OLSON SAW CO., Rt. 6, Bethel, CT 06801. Phone 203-792-8672.

This collection of 100 projects was prepared especially for children between 10 and 15. No special skill is required because full-size patterns are so complete one only has to follow the simple directions. Requires only common tools found around a home. $7 first class. MASTERCRAFT PLANS WEST, P.O. Box 625, Redmond, WA 98073.

Perfect gift for anyone who needs a hand around the house: the new SKIL Super Twist(R) cordless power screwdriver. With twice the power of our best-selling Skil Twist(R), the Super Twist drive larger, longer screws in in no time. Also has automatic collet lock & room to store bits right in the handle. At hardware stores and home centers everywhere.

Emporor offers charming Do-It-Yourself Regulator Clock Kit in solid ¾" Oak. Solid brass West German movement strikes on the half hour and counts the hour. Easy to assemble! Glass included. 30"H X 14½"W X 7"D. Send $1 for full color catalog. EMPEROR CLOCK CO., Dept. 2998, Emperor Industrial Park, Fairhope, AL 36532.



Carbide tipped 15 pc. set router bits in a convenient wooden box. The ¼" shank set contains: ½" radius cove, ⅜" radius round over, 5/32" roman ogee, 45° chamfer, ⅜" depth 22° bevel trim, ½" mortising, ½" grooving, ½" ogee, ½" & ½" flush trimmers at only $119.00 plus $5.00 shipping and handling. CASCADE PRECISION TOOL CO., P. O. Box 848, Mercer Island, WA 98040. 800-236-0272.

DRI-COTE is a sophisticated blend of modern synthetic materials specially formulated for the serious woodworker. It reduces cutting surface friction and lubricates and protects tools. 10 oz. spray bottle only $9.95 + $2 shipping from SANDARO INDUSTRIES, 20 Galli Dr., Suite J, Novato, CA 94949. CA residents add sales tax. 1-800-999-7009.

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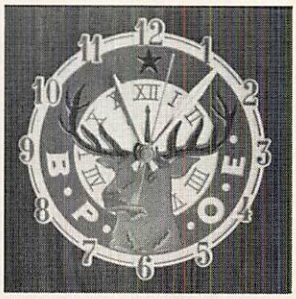


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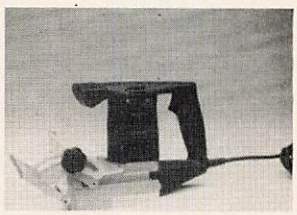

New—Porter Cable #555 with adjustable fence for all angles. Porter Cable #555 is $159; with adjustable fence $199.00. Adjustable fence only for retrofit $59.95. Shipping ppd. Call TOOL CITY at 1-800-423-7899 out of state; in CA 1-800-826-7819.

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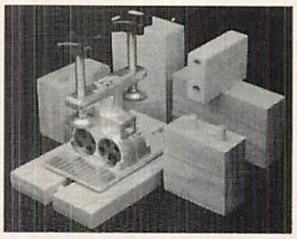

This doweling jig is a significant advance in doweling because it's self-aligning, and automatically matches/aligns mirror-image holes to the second board. Patented design guarantees perfect dowel pin alignment. Dowel Crafter, model G1662, reg. $49.95 now $39.95 ppd. GRIZZLY IMPORTS, INC., P.O. Box 2069, Bellingham, WA 98227; 206-647-0801.

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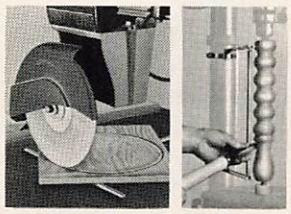

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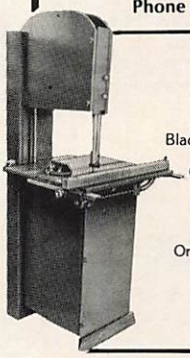

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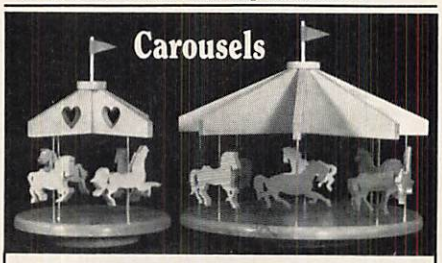

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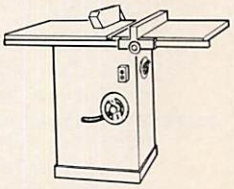

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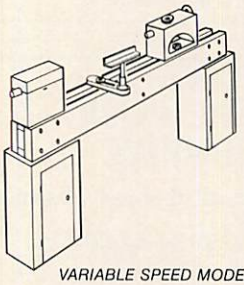

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# ASK WOOD

**Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help. Each issue, we'll consult our experts for answers to your most-asked questions. Send your questions to:**

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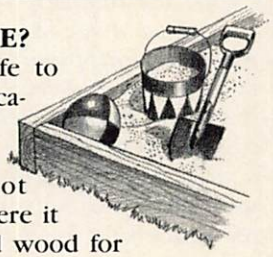
*Due to the volume of mail, we can't promise to answer all questions, but we try! Letters selected for use will be edited for publication.*

---

### IS TREATED LUMBER SAFE?



**Q.** Is Wolmanized lumber safe to use in garden and yard applications? I've heard that lumber treated with chromated copper arsenic (CCA) does not leach out. Recently, I read where it is not safe to use CCA-treated wood for cold frames or as sandbox material where children would be exposed to the wood.

***—Jack Sedlak, Russell, Ohio***

**A.** *We called Dallas and talked to Dennis Macel, a regional sales manager for the Koppers Co. Inc., the firm that holds patent rights to Wolmanized wood. He assures us that picnic tables, sandboxes, fences, and garden frames are some of the best uses of rot-resistant CCA-treated wood. The CCA material, according to Macel, will not leach from the wood.*

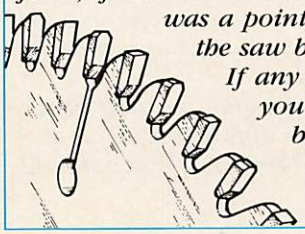
---

### YOU'LL KNOW A BLADE IS DULL WHEN...

**Q.** How to do you determine when a table saw blade is dull? When is it practical and economical to have a dull blade resharpened?

***—Austin T. Moser, Frederick, Md.***

**A.** *Jim Boelling, our Project Builder, suggested seven ways to know if a saw blade needs resharpening: if you feel extra vibration, if the wood smokes and burns, if you can hear extra laboring sounds from the motor, if you notice increasing resistance while feeding the stock, if the stock pulls away from the fence, if the teeth show a shiny spot where there once was a point, or if the cut wood pinches the saw blade.*



*If any of these points occur and if you can't remember when the blade was last resharpened, it's time to visit the sharpening shop!*

*Continued on page 104*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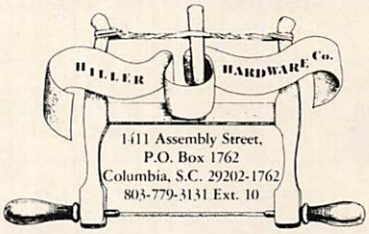


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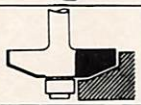
|  | #15 | Raised Panel | 20° Angle | 1-5/8" | 1/2" | $25.00 |
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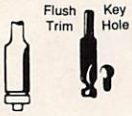
|   | #13 | 1/2" FLUSH TRIM | | 1/2" | 1" | $ 8.50 |
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# ASK WOOD

*Continued from page 103*

## DIPPING TOY PARTS

**Q.** I am making small children's toys from knotty pine ripped and crosscut to ¼x¼x5". I have hundreds of pieces I would like to dip in stain the color of medium-strength tea and then finish with a non-toxic finish.

I have tried vegetable oil, but since I can't wipe off the excess oil from each piece, there is always an oily feeling to the strips.

A quick-penetrating water solution would be best, I believe, as I can heat-dry them with a hair dryer.

***—Aaron H. Paderofsky, Washington, D.C.***

**A.** *We gave John Moser of Wood Finishing Supply in Macedon, N.Y., a call about this one. John suggests you dip the pieces in an alcohol-soluble aniline dye. Adjust the intensity of the stain with alcohol. After the wood dries, dip the pine strips in a lacquer thinned to dipping consistency. "Dipping consistency is tough to determine," John cautions. "If it's too thick, the lacquer dries in strings. You want lacquer to drip off so that the drops separate and don't leave a deposit at the corner. The lacquer dries quickly and toxic-free. You won't need to use heat. In fact, the heat could draw knot resin through the finish."*

## NEVER JOIN BEFORE ITS TIME

**Q.** Some time back, I turned some walnut trinket boxes, laminating strips of ¾"-thick stock built up to 3". I used Franklin Hide Glue. Although not visibly noticeable, several months later I noticed that I could "feel" the glue at each joint. My question is: Should I have used epoxy glue? I've never had this problem before. I would have expected this problem with alaphatic resin glue, but not with hide glue. The wood was seasoned about a year before I glued it up.

***—Howard Ryan, Hamilton, Mont.***

**A.** *The glue is not the problem, Howard. It's too late to put a moisture meter to the wood, but Jim Boelling, our* WOOD *magazine project builder, suspects that from what you've told us, the wood was too wet when you built the boxes. The rule of thumb for air drying is two years for the first inch in thickness and one year for each additional inch. It's a good bet the wood was still shrinking away from the joint when you turned the boxes. Sometimes dressing down thicker stock also will destablilize the stock at the time of gluing. If you can safely remount the boxes on the lathe, they can be turned and finished after the wood has stabilized.*

*And speaking of gluing, hide glue sets best above 70° F. If the room temperature dips below 70° F—as it must on occasion in Montana—you should warm hide glue in water.*

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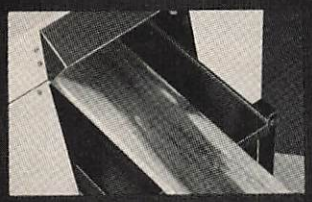
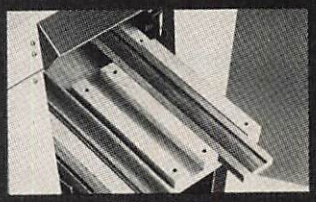
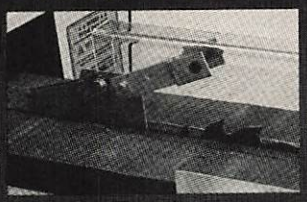


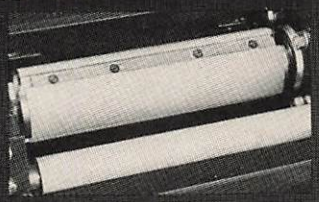
**PLANE**



**MOLD**



**SAW**



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## THE STORY OF
# THE FIDDLE AND THE VIOLIN, A FRONTIER MISHAP

*Chaney Egerton*
*Fort Smyrna*
*Ohio Territory*
*June 11, 1802*

*Dear Uncle Zolly,*
*What a burden has fallen upon my shoulders! Bill Jarvis' mule sat down on the only decent fiddle this side of the Shenandoah. The harvest dance is but three days hence, the young people are sorely vexed, and the job of mending it has fallen to me! I am a good woodworker, but I am no luthier (as these instrument-makers are called). This will surely test my skills. I will continue this letter after the dance, for they are counting on me.*

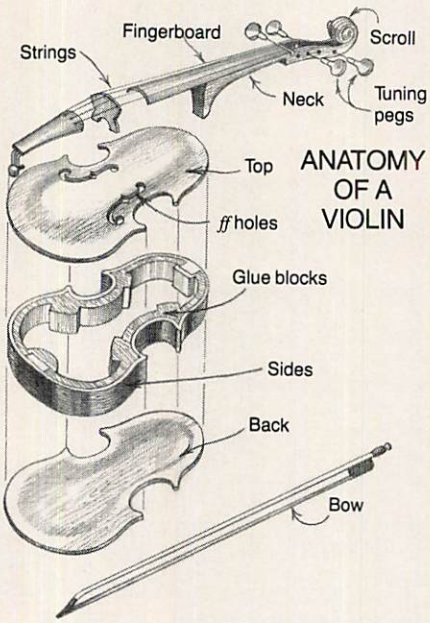
With steam from the kettle, Chaney loosened the remaining glue joints to see what could be saved. The maple neck with its fancy carved scroll and tuning pegs seemed to be alright, as did the ebony fingerboard. The soundbox, however, was smashed. The only other salvageable part was a curious label glued on the inside of the back. Chaney could make no sense of it. It read: "Antonius Stradivarius Cremonensis faciebat Anno 1721."

### The fiddle's resurrection begins

Chaney did recognize the wood of the back and sides of the fiddle as curly maple. He was able to saw them out from a gunstock blank that he had set aside to season many years before. Lacking the tiny convex-bottomed luthier's planes, he duplicated the broken back just as he would make a wooden platter, shaping its outline and then gouging and smoothing the hollows with a scraper made from an old saw blade.

The sides of the fiddle, no thicker than a piece of cardboard, were made from six arching pieces. It was no easy job for him to saw these thin strips from the hard maple. Chaney figured that he would have to dry-bend the wood (steam-bending would make the wood swell up too much), so after heating a musket barrel in the fire, he used it as a hot fulcrum to bend the pieces around. The wood held its shape, but it took him no end of trouble to assemble the six curving pieces with glue blocks at their intersections and then glue them to the back. It is a wonder that he succeeded at all without the aid of a mold, the temporary wooden base used by luthiers.

**Marcus Hansen, instrument maker at Virginia's Colonial Williamsburg, ponders the possible repair of a smashed violin.**




LUTHIER'S OVAL PLANE

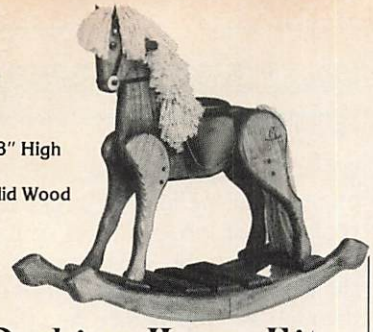
By now, Chaney reckoned this might not be too hard a job. After all, it was just a glued-up box of spruce and maple. Just a 14″-long box made of 70 (even before a mule sits on it) pieces of wood. It was only a 28-oz. box able to hold the 68 lb. pull of the tuned-up strings on one side. Just a little box that can make a thousand people cry or dance with joy, and Chaney had made boxes before.

### Wood with music in it

The top side with the two f-shaped holes in it (he reasoned that they were to let the sound come out) was some kind of quarter-cut spruce. The neighboring cooper had some dry stock set aside for bucket staves, but Chaney must have gone through about a hundred of them before hitting on one that sounded like it had music in it. The original top was made of two pieces glued together down the middle, so Chaney split the stave lengthwise, opened the two pieces out like a book and glued their edges together. He had little time to match the varying thicknesses of the original top, for time was growing short before the dance, and the fiddle must be mended with due haste.

A neatly cut dovetail joined the base of the neck to the topmost glue block in the soundbox. Once he had it set into place, Chaney

*Continued on page 108*



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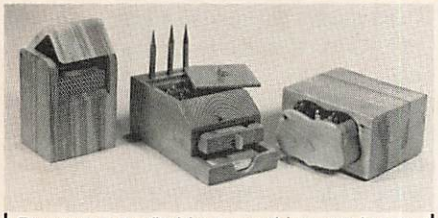

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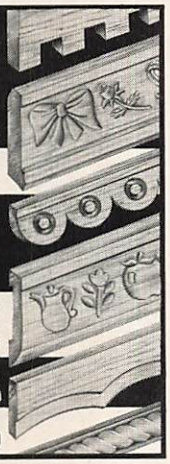

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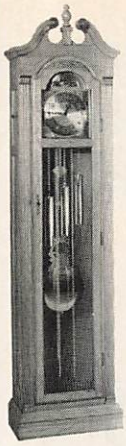

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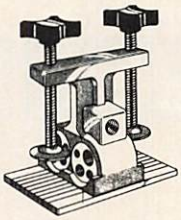

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## OLD HAND WAYS

*Continued from page 106*

knew he had the job licked. In his excitement, he almost forgot to replace that curious label so that it could again be seen through the f-holes that he had whittled through the top before he glued it down.

The two different woods posed a problem when it came to the finishing. Chaney knew that the spruce would take up any stain much faster than the maple and turn much darker. To make an even job of it, he prepared a varnish of rosin, turpentine, and linseed oil. He cooked it in an old iron pot, which made the color deeper the longer it boiled. The third coat was barely dry when he reattached the catgut strings. Drawing the horsehair bow across the strings, Chaney brought forth a sound from the resurrected fiddle — something like the screech of a horse stepping on a cat. But, Chaney had never pretended to be a musician as well as a woodworker.

*Well, dear uncle, I fixed the fiddle, the dance is done, and my fortune is made! A stranger from Philadelphia(!) was at the dance. He asked to examine my fiddle (it was given to me for mending it). He apparently thought less of my outer work than of my inner, because he became highly agitated when he looked inside. "I can't believe it!" he fairly shouted, and offered me $500 for it on the spot!*

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*Your respectful and obedient nephew, Chaney Egerton*


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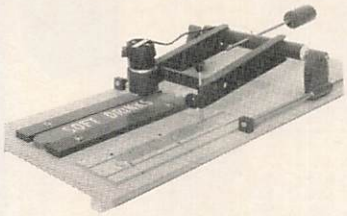

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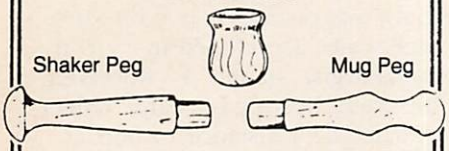


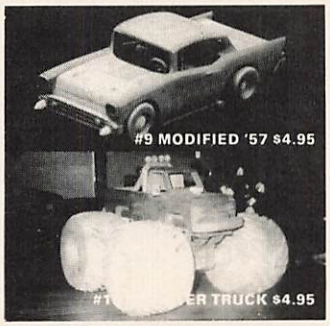


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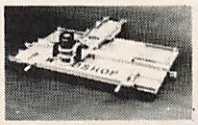

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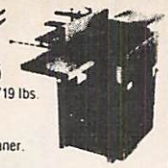

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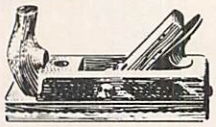

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# SHOP SENSE

## HOW HARD IS HARD?

**If you don't know the difference between a Rockwell scale and the Richter, you're in for a jolt. Granted, buying a hand tool may not be an earth-shaking experience. But, after reading this, you'll at least know what hardness you're paying for.**

To grade the hardness of the tempered steel and carbide used in their tools, manufacturers rely on Rockwell scales. Developed in 1919 by metallurgist Stanley P. Rockwell, the scales bearing his name reflect a material's resistance to impact.

General Motors smashes cars into a barrier to gauge damage susceptibility. Manufacturers use a machine called a *Rockwell Hardness Tester* to drop a weighted, diamond-tipped cone a predetermined distance onto the substance being tested. After impact, the machine precisely measures the minuscule depth that the falling object indents the metal. The depth of penetration then becomes the Rockwell scale reading for the material's grade of hardness--the higher the number, the harder the substance.

To keep Rockwell test results meaningful, different materials have different Rockwell scales. As a woodworker, you need only to understand and remember two of them: the scale for edged tools and the scale for carbide.

### ROCKWELL C VERSUS ROCKWELL A

Chisels, sheath knives, woodturning gouges, and other cutting instruments receive hardness ratings based on the *Rockwell C* (expressed as *RC*) scale tested against a 150-kilogram weight (about 330

pounds). Chisels, for example, generally have a hardness rating from 58 to the mid-60s.

Teeth on many circular saw blades have to be bent to the side, or "set," so, compared to chisels, they must be of a relatively softer-tempered steel. A saw blade with the teeth area tempered to the rating of a chisel would be too brittle to set. Instead, they fall in the Rc 40-45 range, which probably won't be advertised as more than "body of hardened steel."

Manufacturers rate carbide on the *Rockwell A* (expressed as *Ra*) scale tested against a 60-kilogram weight. The ratings read C-1 through C-4—the higher the number, the harder and more brittle the substance.

### FINDING QUALITY IN THE NUMBERS

Manufacturers selling high-quality carbide-tipped saw blades and router bits traditionally pick the correct hardness grade for the job. Barry Dunsmore, assistant vice president of Freud, Inc., notes that the grade of carbide used on tools depends on their application and the amount of abuse or shock they will receive.

Shaper and router cutters, with only two to three wings, contact wood intermittently, and receive intense pounding. Only a softer, C-2 grade carbide can withstand the beating.

Circular saw blades, on the other hand, have enough teeth to receive a more even and constant pressure with less shock. Therefore, teeth can tolerate more brittle grades—up to C-4.

High Rockwell C ratings result in expensive tools. Harder steel holds an edge longer than softer steel. However, the harder the steel, the more brittle it becomes. Softer steel, while it dulls faster, resharpens more quickly. So, perhaps you don't need top-dollar, Rc 65-rated steel. Tools rated as low as Rc 58 will still be an excellent and affordable value.

Illustration: Jim Stevenson


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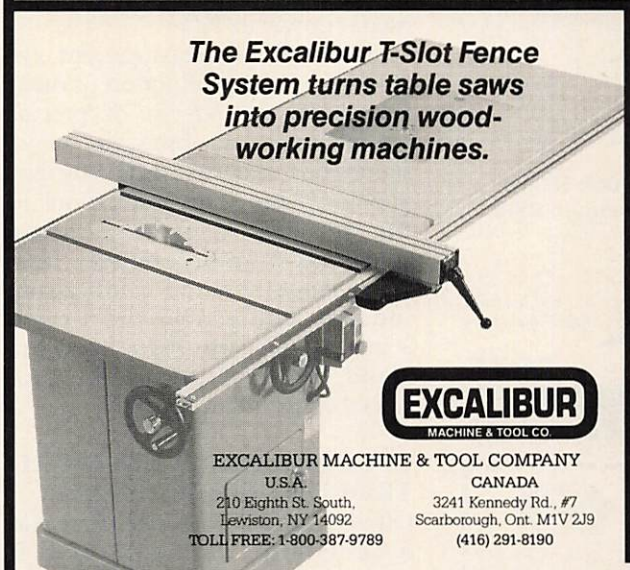

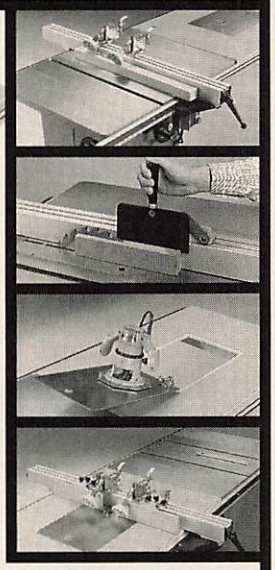

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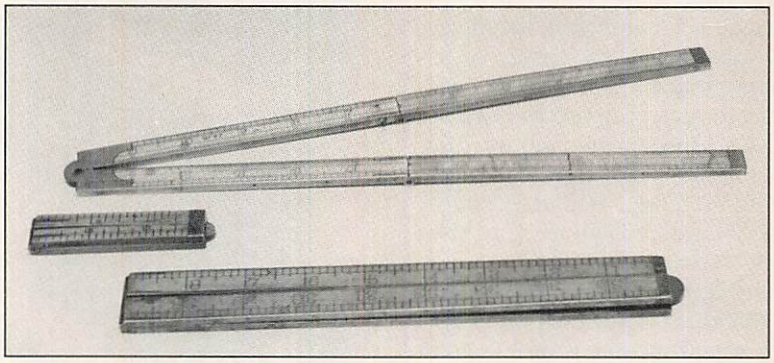
## YESTERDAY'S TOOLS

# FOLDING RULES
## RULED OUT BY PROGRESS



*Top to bottom:* **A 2′ four-fold Stanley No. 87 ivory rule with German silver, valued at about $150; an H. Chapin 1′ four-fold, boxwood rule, valued at about $35; and a 3′ four-fold Lufkin no. 3881 rule, about $30. The arched-top hinge shown on these rules was the most popular type.**

Prior to the establishment of linear standards in Europe and America in the early 19th century, measuring was a highly individual endeavor. In the days when the English inch equaled three round, dry barley grains placed end to end, home-made rules prevailed. Craftsmen cut these handcrafted tools from wood in 2–3′ lengths. Brass nails or saw kerfs marked the increments down to ¼″.

Standards of measurement enabled the mass production of rules. But, until the advent of precise equipment to machine the wood, stamp out and install the hinges, and apply the scale graduations in the mid-1800s, manufacturing rules was a labor-intensive task. With machines, the folding-rule industry boomed in the United States. By the early 1870s, New England manufacturers alone produced more than 50 styles.

### EYE-PLEASING RULES WITH TRIM OF GERMAN SILVER

Offered in two-fold and four-fold models and 1′, 2′, 3′, and 4′ lengths, the machine-made folding rules became standard tools. The arched-top hinge shown *above* became the leading configuration.

For rule bodies, most companies favored boxwood, a dense, stable wood first imported from Turkey and Russia, and later Venezuela. Hickory, mahogany, maple, and rosewood also appeared as rules. However, the most expensive rules were made from elephant ivory.

Corrosion-resistant brass, because it machined easily, became hinges and binding for most rules. For ivory rules, metal mate was German silver (a copper alloy).

### MEASURING ELEGANCE BOWS TO CONVENIENCE

Following the development of the more-easily extended zigzag rule and the compact, coiled-spring tape measure in the early 1900s, the folding rule lost its appeal. The Stanley Rule and Level Company—one of the world's foremost manufacturers of folding rules—discontinued making ivory rules by 1920. By 1945, Stanley sold only a handful of boxwood rules.

Boxwood folding rules sell in the $10 to $20 price range. Unusual examples, such as rules with rare markings, sell for $100 and up. Ivory rules start at $100 in less-than-fine condition, and have been sold for more than $1,000 in prime condition.

*Photograph: Jim Kascoutas*

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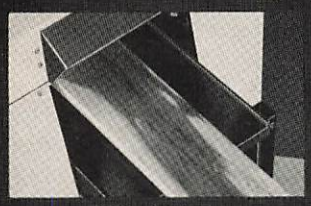
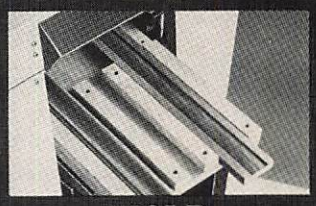
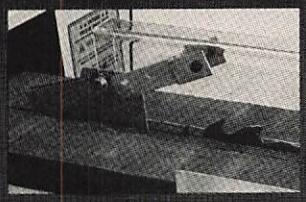


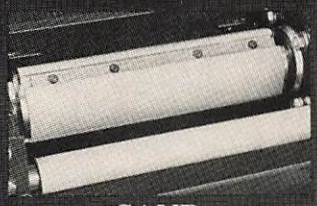
**PLANE**



**MOLD**



**SAW**



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## THE STORY OF
# THE FIDDLE AND THE VIOLIN, A FRONTIER MISHAP

*Chaney Egerton*
*Fort Smyrna*
*Ohio Territory*
*June 11, 1802*

*Dear Uncle Zolly,*
*What a burden has fallen upon my shoulders! Bill Jarvis' mule sat down on the only decent fiddle this side of the Shenandoah. The harvest dance is but three days hence, the young people are sorely vexed, and the job of mending it has fallen to me! I am a good woodworker, but I am no luthier (as these instrument-makers are called). This will surely test my skills. I will continue this letter after the dance, for they are counting on me.*

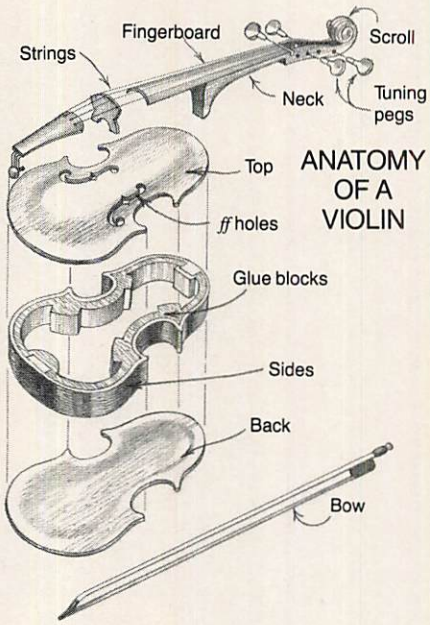
With steam from the kettle, Chaney loosened the remaining glue joints to see what could be saved. The maple neck with its fancy carved scroll and tuning pegs seemed to be alright, as did the ebony fingerboard. The soundbox, however, was smashed. The only other salvageable part was a curious label glued on the inside of the back. Chaney could make no sense of it. It read: "Antonius Stradivarius Cremonensis faciebat Anno 1721."

### The fiddle's resurrection begins

Chaney did recognize the wood of the back and sides of the fiddle as curly maple. He was able to saw them out from a gunstock blank that he had set aside to season many years before. Lacking the tiny convex-bottomed luthier's planes, he duplicated the broken back just as he would make a wooden platter, shaping its outline and then gouging and smoothing the hollows with a scraper made from an old saw blade.

The sides of the fiddle, no thicker than a piece of cardboard, were made from six arching pieces. It was no easy job for him to saw these thin strips from the hard maple. Chaney figured that he would have to dry-bend the wood (steam-bending would make the wood swell up too much), so after heating a musket barrel in the fire, he used it as a hot fulcrum to bend the pieces around. The wood held its shape, but it took him no end of trouble to assemble the six curving pieces with glue blocks at their intersections and then glue them to the back. It is a wonder that he succeeded at all without the aid of a mold, the temporary wooden base used by luthiers.

**Marcus Hansen, instrument maker at Virginia's Colonial Williamsburg, ponders the possible repair of a smashed violin.**



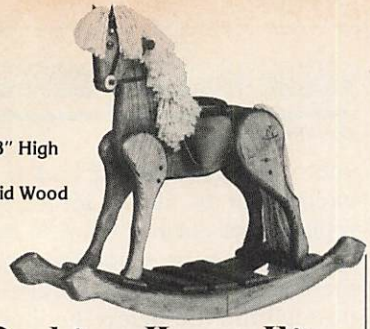

By now, Chaney reckoned this might not be too hard a job. After all, it was just a glued-up box of spruce and maple. Just a 14″-long box made of 70 (even before a mule sits on it) pieces of wood. It was only a 28-oz. box able to hold the 68 lb. pull of the tuned-up strings on one side. Just a little box that can make a thousand people cry or dance with joy, and Chaney had made boxes before.

### Wood with music in it

The top side with the two f-shaped holes in it (he reasoned that they were to let the sound come out) was some kind of quarter-cut spruce. The neighboring cooper had some dry stock set aside for bucket staves, but Chaney must have gone through about a hundred of them before hitting on one that sounded like it had music in it. The original top was made of two pieces glued together down the middle, so Chaney split the stave lengthwise, opened the two pieces out like a book and glued their edges together. He had little time to match the varying thicknesses of the original top, for time was growing short before the dance, and the fiddle must be mended with due haste.

A neatly cut dovetail joined the base of the neck to the topmost glue block in the soundbox. Once he had it set into place, Chaney

*Continued on page 108*



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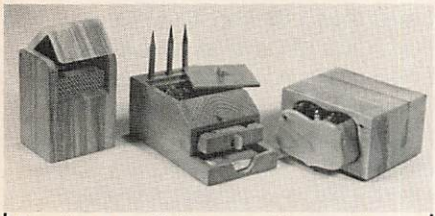

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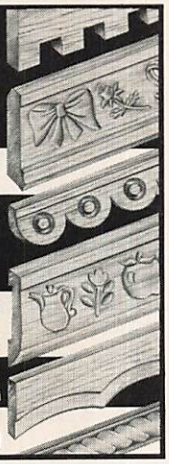

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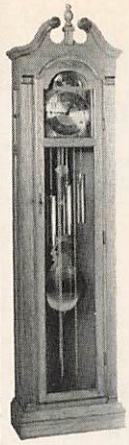

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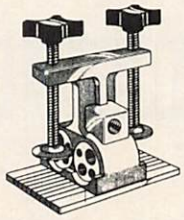

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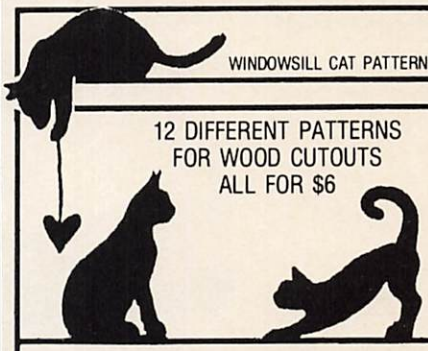

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## OLD HAND WAYS

*Continued from page 106*

knew he had the job licked. In his excitement, he almost forgot to replace that curious label so that it could again be seen through the f-holes that he had whittled through the top before he glued it down.

The two different woods posed a problem when it came to the finishing. Chaney knew that the spruce would take up any stain much faster than the maple and turn much darker. To make an even job of it, he prepared a varnish of rosin, turpentine, and linseed oil. He cooked it in an old iron pot, which made the color deeper the longer it boiled. The third coat was barely dry when he reattached the catgut strings. Drawing the horsehair bow across the strings, Chaney brought forth a sound from the resurrected fiddle — something like the screech of a horse stepping on a cat. But, Chaney had never pretended to be a musician as well as a woodworker.

*Well, dear uncle, I fixed the fiddle, the dance is done, and my fortune is made! A stranger from Philadelphia(!) was at the dance. He asked to examine my fiddle (it was given to me for mending it). He apparently thought less of my outer work than of my inner, because he became highly agitated when he looked inside. "I can't believe it!" he fairly shouted, and offered me $500 for it on the spot!*

*Should I ever have to work again, I am determined it shall be as a LUTHIER, for it is a dandy business.*

*Your respectful and obedient nephew, Chaney Egerton*


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Illustrations: Jim Stevenson

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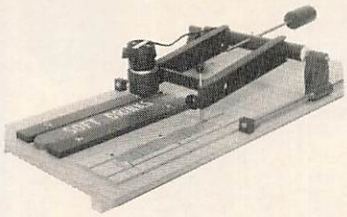

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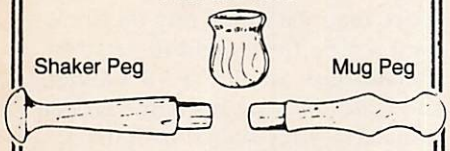


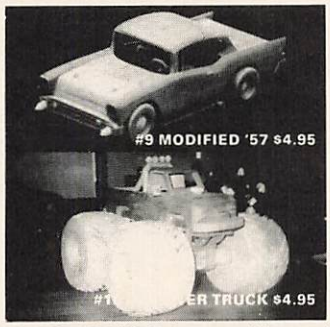


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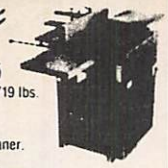

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To grade the hardness of the tempered steel and carbide used in their tools, manufacturers rely on Rockwell scales. Developed in 1919 by metallurgist Stanley P. Rockwell, the scales bearing his name reflect a material's resistance to impact.

General Motors smashes cars into a barrier to gauge damage susceptibility. Manufacturers use a machine called a *Rockwell Hardness Tester* to drop a weighted, diamond-tipped cone a predetermined distance onto the substance being tested. After impact, the machine precisely measures the minuscule depth that the falling object indents the metal. The depth of penetration then becomes the Rockwell scale reading for the material's grade of hardness--the higher the number, the harder the substance.

To keep Rockwell test results meaningful, different materials have different Rockwell scales. As a woodworker, you need only to understand and remember two of them: the scale for edged tools and the scale for carbide.

### ROCKWELL C VERSUS ROCKWELL A

Chisels, sheath knives, woodturning gouges, and other cutting instruments receive hardness ratings based on the *Rockwell C* (expressed as *RC*) scale tested against a 150-kilogram weight (about 330

pounds). Chisels, for example, generally have a hardness rating from 58 to the mid-60s.

Teeth on many circular saw blades have to be bent to the side, or "set," so, compared to chisels, they must be of a relatively softer-tempered steel. A saw blade with the teeth area tempered to the rating of a chisel would be too brittle to set. Instead, they fall in the Rc 40-45 range, which probably won't be advertised as more than "body of hardened steel."

Manufacturers rate carbide on the *Rockwell A* (expressed as *Ra*) scale tested against a 60-kilogram weight. The ratings read C-1 through C-4—the higher the number, the harder and more brittle the substance.

## FINDING QUALITY IN THE NUMBERS

Manufacturers selling high-quality carbide-tipped saw blades and router bits traditionally pick the correct hardness grade for the job. Barry Dunsmore, assistant vice president of Freud, Inc., notes that the grade of carbide used on tools depends on their application and the amount of abuse or shock they will receive.

Shaper and router cutters, with only two to three wings, contact wood intermittently, and receive intense pounding. Only a softer, C-2 grade carbide can withstand the beating.

Circular saw blades, on the other hand, have enough teeth to receive a more even and constant pressure with less shock. Therefore, teeth can tolerate more brittle grades—up to C-4.

High Rockwell C ratings result in expensive tools. Harder steel holds an edge longer than softer steel. However, the harder the steel, the more brittle it becomes. Softer steel, while it dulls faster, resharpens more quickly. So, perhaps you don't need top-dollar, Rc 65-rated steel. Tools rated as low as Rc 58 will still be an excellent and affordable value.

Illustration: Jim Stevenson


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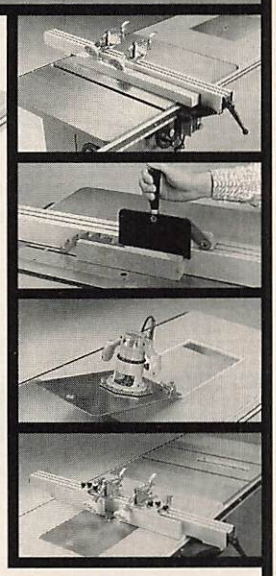

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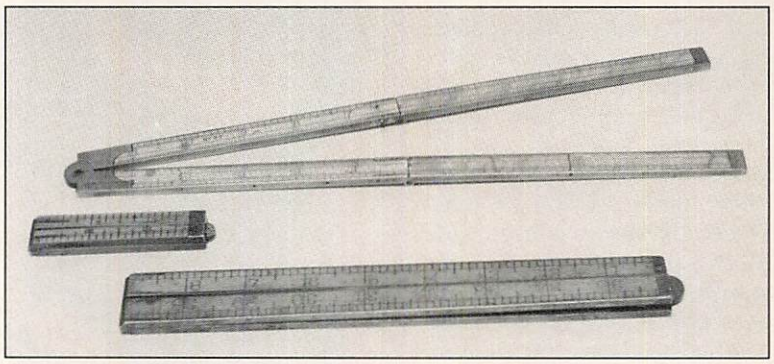
## YESTERDAY'S TOOLS

# FOLDING RULES
## RULED OUT BY PROGRESS



*Top to bottom:* **A 2′ four-fold Stanley No. 87 ivory rule with German silver, valued at about $150; an H. Chapin 1′ four-fold, boxwood rule, valued at about $35; and a 3′ four-fold Lufkin no. 3881 rule, about $30. The arched-top hinge shown on these rules was the most popular type.**

Prior to the establishment of linear standards in Europe and America in the early 19th century, measuring was a highly individual endeavor. In the days when the English inch equaled three round, dry barley grains placed end to end, home-made rules prevailed. Craftsmen cut these handcrafted tools from wood in 2–3′ lengths. Brass nails or saw kerfs marked the increments down to ¼″.

Standards of measurement enabled the mass production of rules. But, until the advent of precise equipment to machine the wood, stamp out and install the hinges, and apply the scale graduations in the mid-1800s, manufacturing rules was a labor-intensive task. With machines, the folding-rule industry boomed in the United States. By the early 1870s, New England manufacturers alone produced more than 50 styles.

### EYE-PLEASING RULES WITH TRIM OF GERMAN SILVER

Offered in two-fold and four-fold models and 1′, 2′, 3′, and 4′ lengths, the machine-made folding rules became standard tools. The arched-top hinge shown *above* became the leading configuration.

For rule bodies, most companies favored boxwood, a dense, stable wood first imported from Turkey and Russia, and later Venezuela. Hickory, mahogany, maple, and rosewood also appeared as rules. However, the most expensive rules were made from elephant ivory.

Corrosion-resistant brass, because it machined easily, became hinges and binding for most rules. For ivory rules, metal mate was German silver (a copper alloy).

### MEASURING ELEGANCE BOWS TO CONVENIENCE

Following the development of the more-easily extended zigzag rule and the compact, coiled-spring tape measure in the early 1900s, the folding rule lost its appeal. The Stanley Rule and Level Company—one of the world's foremost manufacturers of folding rules—discontinued making ivory rules by 1920. By 1945, Stanley sold only a handful of boxwood rules.

Boxwood folding rules sell in the $10 to $20 price range. Unusual examples, such as rules with rare markings, sell for $100 and up. Ivory rules start at $100 in less-than-fine condition, and have been sold for more than $1,000 in prime condition.

*Photograph: Jim Kascoutas*

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*Problem: How to stop the draft from drafty windows.*
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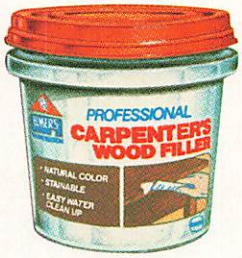
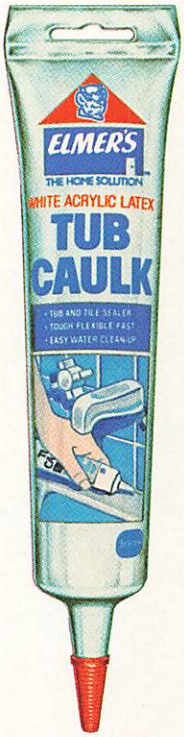
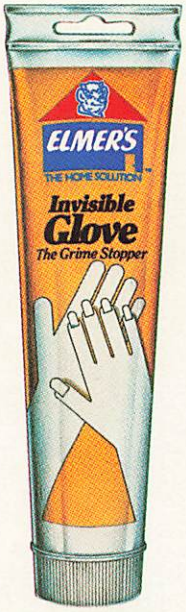
*Problem: How to repair a crack in a wall.*
THE HOME SOLUTION™: Elmer's Redi-Spack™ spackling compound. Fast-drying acrylic latex formula stays flexible but sands easily.




*Problem: How to patch the deep gouge in the dining room table.*
THE HOME SOLUTION™: Elmer's Carpenter's Wood Filler. Resists shrinking and accepts dark and light stain.




*Problem: How to replace caulking around your tub and tile.*
THE HOME SOLUTION™: Elmer's Tub Caulk. Provides a flexible seal that's water and mildew resistant.

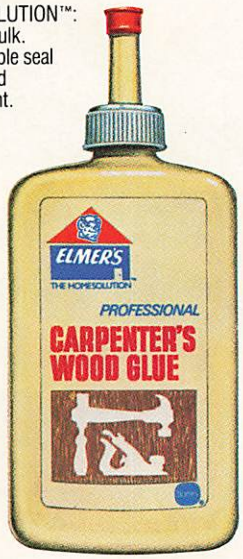



*Problem: How to protect your hands from paint, oil and grease.*
THE HOME SOLUTION™: Elmer's Invisible Glove™ Protective Hand Cream. Just apply before any dirty job.

*Problem: How to replace broken window glass.*
THE HOME SOLUTION™: Elmer's Glaze-Tuff™ glazing compound. It's paintable in only 30 minutes.

*Problem: How to patch the nicks and scratches in the dining room table.*
THE HOME SOLUTION™: Elmer's Fill'N Finish. Perfect for delicate work. Accepts all kinds of stains, paint and varnish. Easy to sand, too.

*Problem: How to attach Formica® to a countertop.*
THE HOME SOLUTION™: Elmer's Contact Cement. Forms a strong bond.




*Problem: How to glue the arm back on the armchair.*
THE HOME SOLUTION™: Elmer's Carpenter's Wood Glue. Penetrates wood deeply for a strong bond.

# Bosch Variable Speed Belt Sander: As Good At Fine Finishing As It Is At Finishing Fast.

## One Finger Control Lets You Dial-In The Speed You Need.

Now you can rely on more than just the grit of your sandpaper—and the muscles of your arms—to control the quality of your sanding. Believing is getting your hands on the versatile Model 1273DVS variable speed belt sander by Bosch.

With six different speed ranges to choose from, the 1273DVS lets you take advantage of the power of a belt sander on jobs you might not have thought possible. Choose a lower speed with a fine grit for finishing sanding—or with a coarse grit to reduce heat build-up and clogging. Combine the higher speeds with a coarser grit for faster stock removal, no matter what the material. The speed selector dial is conveniently located just under the trigger. And the on-board sanding guide helps you select the right speed for your job.

| | |
|---|---|
| SOLID WOOD | 4-6 |
| VENEER | 3-5 |
| CHIP BOARD | 5-6 |
| PLASTICS | 3-5 |
| STEEL | 3-6 |
| PAINT REMOVAL | 3-6 |

The powerful 10.5 amp motor gives you power—even for heavy-duty production sanding. And this sander's fine balance lets you control that power with minimal effort.

Use the 1273DVS with its own dust collection bag—or connect it to the Bosch Air Sweep™ Dust Extraction system. Change belts with the snap of a lever. And the unique belt tensioning system makes sure belts stay centered through all kinds of work.

So check out what a world class variable speed belt sander can do for the quality of your sanding. See your Bosch Distributor today—he's listed in the Yellow Pages "Tools—Electric." Let him show you how this belt sander gives you more control with one finger than others do with two hands.

**BOSCH**

*"Quality You Can Hold On To."*

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